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The *Journal of Clinical Psychology* is an independent journal dedicated to the advancement of the clinical method in psychology. Although primarily a scientifically oriented professional journal limited to publication of original research reports and authoritative theoretical articles, it aims to foster the promotion and expansion of clinical psychology as an applied science. Special sections in each issue will be devoted to news, comments, and letters to the editors on matters pertinent to the profession. Communications and articles submitted for publication are welcome and should be addressed to the Editorial Office, Medical College Building, University of Vermont, Burlington, Vermont.

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THE ARTHUR ADAPTATION OF THE LEITER INTERNATIONAL PERFORMANCE SCALE

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INTRODUCTION

The Arthur Adaptation of the Leiter[6] International Performance Scale is, in principle, a non-verbal Binet scale for young children.* Its main advantages are: (1) it reaches down to lower chronological age levels than the other performance scales, (2) the tests lowest in the scale are tests of ability to learn rather than tests of acquired skills or material already learned: the first five tests are given credit as *passed* if the subject is able to perform the task without demonstration or help during any one trial, no matter how many previous trials have been given and without regard to the amount of demonstration and help it has been necessary to give during previous trials; (3) every test of the scale is given without a time limit; and (4) the entire scale is given, as it was standardized, without any verbal directions.

The need for restandardization of the original Leiter scale was felt when it became evident that the Leiter norms for "Caucasian" children were too high to enable the average middle-class American child to earn a score that adequately represented his level of ability. The need for the reorganization of the scale was felt in order to get rid of certain tasks demanding acquired skills such as telling time, and to eliminate the timing of any of the tests to facilitate the use of the scale with spastics.

During the standardization of the Arthur Adaptation of the Leiter scale, more help has been given to the subject to insure comprehension of the task than was indicated in the original Leiter scale. With only four tests at each age level, an accidental success or failure has too much effect on the final score. It is because of the small number of tests at each chronological age level that the Arthur Adaptation of the Leiter scale is supplemented with the Revised Form II of the Point Scale of Performance Tests[3] to increase the reliability of the rating obtained. The increase in time needed for examination on both scales is important in itself, as the subject is under observation for a longer period under controlled conditions, and has more opportunity to demonstrate the average intellectual level of his reaction pattern.

The Arthur Adaptation of the Leiter scale is devised to measure ability of children from 3.0 to 7.99 years of age, inclusive, and the ability of others whose mental age is expected to fall within this range. It is for children from 4.0 to 7.99 years of age, inclusive, that the Revised Form II is used to supplement and increase the reliability of this scale.

Ratings obtained by combining results from the Arthur Adaptation of the Leiter scale and the Revised Form II of the Point Scale of Performance Tests serve every purpose of a reliable measurement of general intelligence except in the area of oral or written response. These ratings are especially useful for children with a foreign language handicap, or with delayed speech. Accurate measurement

*A research grant from the Amherst H. Wilder Charity of Saint Paul made this adaptation and standardization possible.

of the ability of such children at an early age is essential if their training is to be adapted to their developmental level.

The Materials

The original Leiter material consisted of a heavy mahogany cabinet with seven shallow drawers, six of which were partitioned off to hold the one-inch cubes and the pattern strips required for the various tests of the scale. The top drawer contained six frames for holding pattern strips of varying lengths. In response to my plea for lighter and less cumbersome equipment, Doctor Leiter devised a frame with a sliding metal clip to hold the pattern strips in place. This single frame takes the place of the six frames of varying length of the original scale. The heavy cabinet has been replaced, at my urgent request, by two light-weight boxes of stout cardboard, partitioned off to keep blocks and pattern strips for the various tests separate and in order, and covered to keep materials in place and protected. These two covered cardboard boxes fit snugly into a specially constructed canvas cover that closes with a zipper and can be carried by its stout canvas handle. It is easy to manipulate, light weight and convenient for traveling clinics.

Of the original scale[6], the following test materials remain unchanged in the Arthur Adaptation: Tests II—1, 2, 3, 4; III—1, 2, 3, 4; IV— 1, 2, 3, 4; V—1, 2, 3, 4; VI—1, 2, 3, 4; VII—1, 2, 3, 4; VIII—1, 2, 3, 4; IX—1. In place of IX—2, Test XI—4 is substituted to get rid of the need on the part of the patient for experience in telling time. Tests IX—3 and IX—4 remain unchanged. Tests X—1 and 2 also remain unchanged. For Test X—3 five plain one-inch wooden cubes are added to the materials, for demonstrating the counting of concealed cubes. Test X—4 is omitted and replaced by Test XI—1. Tests XI—2 and XI—3 are omitted. Tests XII—1, 2, 3, 4 remain unchanged.

All tests beyond XII—4 of the Leiter International Performance Scale are omitted in the Arthur Adaptation of that scale. As none of the tests are timed in the Arthur Adaptation of the Leiter scale, no stopwatch is needed.

Standardization

The same district of middle-class Americans was used in the standardization of this scale that was used in standardizing Form I and the Revised Form II of the Point Scale of Performance Tests. The Arthur Adaptation of the Leiter International Performance Scale was given either the same day or within a week of the Revised Form II. The term "middle-class" is used on the basis of the occupational classification of the population that was made at the time of the standardization of Form I[2]. It was found that there were few cases at either extreme of the occupational scale, but a massing of cases in the Skilled and Semi-skilled labor groups. It is American in the sense that the parents of most of these children were born in this country, and many of the families had been here for several generations. This district was supplemented by the Wilder Day Nurseries. On the basis of long experience with the children of these nurseries, it was assumed that the present population would have an average IQ of approximately 100. The precaution was taken to obtain tests of *all* the children of a given chronological age that were registered in the nurseries at the time the testing was in progress, as the irregular attendants and the reluctant souls are the ones who bring down the norms to a level that indicates the average performance of all the group, and furnishes a reliable basis for evaluating the performance of children of the general population.

In all, 289 children were examined with the Arthur Adaptation of the Leiter scale. They ranged in chronological age from 3.0 to 7.99 years, inclusive. This number seemed to furnish an adequate sampling for the population under consideration, as the first tentative norms (medians) were not changed by doubling the number of cases. The distribution according to chronological age groups is given in Table 1.

The mental age from the Arthur Adaptation of the Leiter scale and the mental age for the Revised Form II of the Point Scale of Performance Tests were averaged for the children of the 4-, 5-, 6- and 7-year-old age groups, and the IQ cal-

TABLE 1. *Age and sex distributions of standardization group*

C. A.	Girls	Boys	Total
3.0 to 3.99	20	38	58
4.0 to 4.99	30	34	64
5.0 to 5.99	24	32	56
6.0 to 6.99	29	23	52
7.0 to 7.99	31	28	59
	134	155	289

culated in the usual manner. For comparison with later ratings, the average mental age obtained with the two scales was used to obtain the Personal Constant[4], or Per Cent of Average, as Hilden[5] calls it, by reading from table.

Approximately three years later, 48 children were reexamined, this time with the Stanford-Binet scale, and Form I of the Point Scale of Performance Tests[1]. All form board material was omitted from Form I except the Seguin, in order to render it parallel to the Revised Form II. For these 48 children, the chronological age at the time of the first examination ranged from 4.0 to 7.58 years, inclusive. At the time of the reexamination, the chronological age ranged from 8 years and 3 months to 11 years and 3 months, inclusive. The median chronological age at the time of the first examination was 6 years and 1 month. The median chronological age at the time of the reexamination was 9 years and 1.5 months. The range of the interval between test and retest was from 2 years and 10 months to 4 years and 3 months. The median interval was 3 years and 1 month.

A comparison of the Personal Constant (or Per Cent of Average)[5] obtained for these 48 children by combining the ratings on the Arthur Adaptation of the Leiter Scale and the Revised Form II of the Point Scale of Performance Tests, with the Personal Constant obtained three years later with the Stanford-Binet Scale and that obtained on Form I with all form boards except the Seguin omitted, is shown in Table 2.

The only basis of selection for this group of 48 children was that they were non-migratory: they were available for reexamination after an interval of three years. This in itself may help to account for the fact that the median rating is slightly above average. However, this group does not include all the children available for reexamination in the schools at that time.

From the data presented in Table 2, it would seem that the rating in terms of Personal Constant (P. C.) obtained with the Arthur Adaptation of the Leiter International Performance Scale and the Revised Form II of the Point Scale of Performance Tests gives a dependable basis for prediction of what a child from 4.0 to 7.58 years of age will be likely to achieve three years later when examined with the abridged Form I of the Point Scale of Performance Tests or with the Stanford-Binet Scale.

SCORING

The procedures in the Arthur Adaptation are identical with those of the original Leiter scale, with the following exceptions:

At the lower age levels, in tests where full credit is given for placement of blocks in the correct notches, the examiner corrects the alignment after the subject indicates that he has finished.

For Test III-2, the examiner points to the next space to be filled for each space, successively, until the test is completed.

All block design tests are given without timing. If a block design test at one level is failed,

TABLE 2. *Comparison of personal constants (P. C.) calculated from various ratings*

	Range (P. C.)	Q_1	M	Q_3
P. C. from Arthur Adaptation of Leiter Scale, and Form II combined	85-118	98	102	109.5
Three years later				
1. P. C. from Form I (all form boards but Seguin omited)	84-118	100.5	104	107
2. P. C. from Stanford-Binet	95-121	102	104	107

no further block design tests at higher levels are given. They are recorded as failures.

If Test VI-1 is failed, the correct solution is demonstrated.

For Test VI-2, the examiner points to each space to be filled, waiting for the subject to fill one notch before pointing to the next. This is done for both Form A and Form B.

If Test VII-2 is failed, the examiner demonstrates the correct solution.

For Test X-3, the examiner builds the first design with the plain wooden cubes provided for the purpose, The examiner points to each cube as he counts it, silently, then selects the *2* block and places it in the first notch. The second design is then built with the plain wooden cubes, the examiner points to each cube as he silently counts it, and then places the *5* block in the second notch. After the second notch is filled, no further help, suggestion or demonstration is given.

The scoring of the Arthur Adaptation of the Leiter scale follows the general principle of the mental age scale, except that a score of:

II.0 yields a mental age of 2 yrs. and 6 mos.
III.0 yields a mental age of 3 yrs. and 6 mos.
IV.0 yields a mental age of 4 yrs. and 3 mos.
V.0 yields a mental age of 5 yrs. and 3 mos.
VI.0 yields a mental age of 6 yrs. and 3 mos.
VII.0 yields a mental age of 7 yrs. and 3 mos.
VIII.0 yields a mental age of 8 yrs. and 3 mos.
IX.0 yields a mental age of 9 yrs. and 3 mos.

These values are used as basal mental ages. Each test passed at the four-year level, earns an additional 2¼ months of mental age beyond the basal mental age. Each test passed at the 12-year level, earns an additional 6 months of mental age. Every other test passed beyond the basal mental age earns an additional 3 months of mental age.

The child who passes all the two-year tests and all the three-year tests earns a basal mental age of 3 years and 6 months. If he passes 3 tests at the 4-year level, he will add 3 times 2¼ months or 7 months to his basal mental age. One test passed at the 5-year level will add 3 months more. This will give him 3 years and 6 months plus 7 months plus 3 months, or a mental age on this scale of 4 years and 4 months.

If he passes all the tests at the 4-year and 5-year levels, he will earn a basal mental age of 5 years and 3 months. Two tests passed at the 6-year level and one passed at the 7-year level would give him 3 times 3 months or nine additional months, which added to his basal mental age would give him a mental age of 6.0 years on this scale.

This increase in mental age earned, over that credited for the same performance on the original Leiter scale has greatly increased the usefulness of this scale for the children with whom it has been tried. The difference is especially marked at the lower age levels.

Discussion

A little girl with speech so indistinct that it was only occasionally understandable, was still in kindergarten at the age of nine years. She had earned a Binet IQ of 57, with a Binet mental age that indicated she was not yet ready for training beyond kindergarten level. On the Arthur Adaptation of the Leiter scale she earned a mental age of 7 years and 3 months. On the Revised Form II of the Point Scale of Performance Tests she earned a mental age of 8 years and 5 months, with better than average scores on the Stencil Design Test I, and the Porteus Maze test. Averaging these mental ages gave a combined mental age of 7 years and 10 months which yielded an IQ of 80.

On the basis of this mental age, individual teaching was begun at once at Grade I level. By the time school closed in June, she was working with a group and had completed the work of the first grade. According to the results of standardized tests of school achievement, she was prepared to begin the work of Grade II. Unfortunately, there was no corrective speech teacher in her school, and none available in the place where she lived. However, the reading teacher helped her to pronounce correctly each word that she met in her beginning reading lessons, and gradually her speech showed improvement.

A five-year-old boy was kept out of kindergarten because he talked very little, and only part of what he said could be understood. He accomplished very little on the Binet scale, and received only a question mark in place of an IQ because of the number of test situations in which he was unable to respond because of his delayed speech. The combined rating from the Arthur Adaptation

of the Leiter scale and the Revised Form II of the Point Scale of Performance Tests yielded an IQ of 140. This was in keeping with intelligence ratings earned by the other children in his family. His work was meticulously careful. He looked over his completed tasks, and corrected mistakes of alignment. There was every reason to accept this non-verbal rating as a valid measurement of his rate of intellectual development.

Children with spastic conditions that are not too severe, find the form of response required by the Arthur Adaptation of the Leiter scale comparatively easy to negotiate. Many who are unable to speak clearly or to manipulate material successfully, either because of a time limit or due to difficulty in dealing with spatial relations, can manage without too great effort the simple reaction of pushing a one-inch cube into the stall where it belongs. This does not imply that all spastics do well on this scale. Some do not. But their failure is due to some factor other than inability to make the reaction that will express the result of their thinking, except in cases where lack of motor coordination is most severe. Often, the spastic child tends to do best in tests of learned material in which the Binet scales abound. For this reason, the Binet scales obtain an optimal rating for the spastic child who can talk understandably. The present scale gives the spastic child an opportunity to demonstrate his ability to do independent thinking.

American Indian children adapt readily to the form of response used in this scale. The few cases tested were shy children, with little English at their command, but their scores distributed closely around IQ 100. As with other groups, ratings are more reliable when supplemented with the Revised Form II of the Point Scale of Performance Tests.

SUMMARY

The Arthur Adaptation of the Leiter International Performance Scale is, in principle, a non-verbal Binet scale. It reaches down to lower chronological age levels than most other performance scales. The tests lowest in the scale are tests of ability to learn, rather than tests of learned material. The entire scale is given, as it was standardized, without any verbal directions. The need for restandardization of the original Leiter scale was felt when it became evident that the Leiter norms for "Caucasian" children were too high to enable the average middle class American child to earn a score that represented his level of ability. The reorganization of the scale was undertaken to get rid of tests requiring acquired skills like telling time, and to eliminate timing of the tests in order to facilitate the use of the scale with spastics.

The Arthur Adaptation of the Leiter scale is devised to measure the ability of children from 3.0 to 7.99 years of age, inclusive, and the ability of others whose mental ages are expected to fall within this range. For children from 4.0 to 7.99 years of age, inclusive, the Revised Form II of the Point Scale of Performance Tests is used to supplement and increase the reliability of this scale. The data indicate that the rating in terms of Personal Constant (Per Cent of Average) obtained with the Arthur Adaptation of the Leiter International Performance Scale and the Revised Form II of the Point Scale of Performance Tests gives a dependable basis for prediction of what a child from 4.0 to 7.58 years of age will be likely to achieve three years later when examined with the abridged Form I of the Point Scale of Performance Tests or with the Stanford-Binet scale.

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SOME SOURCES OF ERROR IN THE NEUROPSYCHIATRIC STATISTICS OF WORLD WAR II*

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The statistics available from the multitude of military neuropsychiatric activities during World War II offer a wealth of interpretative material for the further understanding of mental disorder. If the period following the first World War is any criterion, we may expect that these statistics will continue to be quoted in varying theoretical contexts for some time to come. While figures "do not lie," they are no more reliable than the basic data from which they are derived, and the translation of inadequate empirical data into numerical symbols often creates a spurious impression of objectivity and validity which is misleading. Those military psychiatrists and psychologists who actively participated in the neuropsychiatric activities which produced these statistics will be aware of their deficiencies and will interpret them with caution, but unfortunately statistics live on to become public property and will be used by many interested persons who are unacquainted with the actual conditions under which the basic data were obtained. It therefore seems desirable to enter a word of caution in the record.

During World War II the authors were actively engaged in the practice of Naval neuropsychiatry[6] and since that time have been conducting a research project which involves the individual analysis of large numbers of Naval medical case records as well as the statistics resulting therefrom[7]. The materials here presented were gathered during that experience. While our data are limited to Naval sources, there seems no reason to assume they are not typical of military neuropsychiatry as a whole.

The purpose of the present article is to identify and list some common sources of error in military neuropsychiatric statistics, and to illustrate each with appropriate examples drawn from the available records. In doing so we have no intention of discrediting military neuropsychiatry, nor of denying the usefulness of the statistics which it has given us. We merely wish to point out certain flaws inherent in these figures and indicate the limitations which such errors place upon our interpretation.

The errors which we shall discuss fall roughly into two main categories each of which possesses several sub-types. The first and most important category is that of errors attributable to faulty diagnosis. Our statistics are merely a numerical representation of the basic case diagnoses involved and unless these diagnoses are correct, the figures taken from them can have no meaning. The second category is a more sophisticated one and involves errors attributable to faulty sampling techniques. Unless the sample population from which our statistics are drawn is adequate for our purposes, any generalizations resulting are valueless. In the pages to follow we will enumerate various types of error under each of these categories and illustrate them with concrete examples.

These errors attributable to erroneous diagnoses may in turn be classified under two headings—misses, or failures to recognize existent psychopathosis, in which case the individual is classed as normal although in reality he is mentally ill; and false diagnoses, in which a normal individual is falsely classed as ill, or in which an ill individual is given a diagnosis not fitted to his true condition. These in turn may be split into sub-categories. We will deal first with the misses, cases in which the existence of psychopathosis goes unnoticed. These may be *simple misses* attributable to professional error on the part of the examining psychiatrist; they may be *deliberate misses* with the psychiatrist choosing to overlook the existing psychopathosis; they may be

* This study is part of a larger project subsidized by the Office of Naval Research under their policy of encouraging basic research. The opinions expressed, however, are those of the individual authors and do not represent the opinions or policy of the Naval service.

caused by *the absence of any examining facility, i.e.,* the absence of a psychiatrist; and they may be attributable to *the lack of any facility for disposal,* as when a patient's condition may be recognized but not entered in the official statistics owing to the absence of any facility such as a hospital or survey board to which the patient can be referred for disposal. These categories are not exhaustive, but will cover the main types of error. We will list each individually and illustrate it.

Failure to Diagnose

Simple misses. That many cases of psychopathosis never were entered in the official statistics because they were not recognized by the examining psychiatrist seems obvious, but some documentation may point it up and help to indicate the amount of error. Examinations at the induction centers were necessarily brief and inadequate. A careful check of the first 3,000 recruits examined at the Newport Naval Training Station immediately upon arrival from induction centers showed an incidence of neuropsychiatric disability of over 5%[4]. The Navy's practice of reexamining all inductees upon arrival at a Naval Training Center was necessitated by this error at induction centers since both services were geared roughly to the same standards. The over-all Navy special order discharge rate resulting from such reexaminations averaged around 3% for 1943, 1944, and the first half of 1945.

There were wide differences in efficiency between induction centers. An analysis of all special order discharges at Newport during May, 1943 showed that of the two large induction centers serving as the main sources of recruits at the time, one was sending twice as many misfits. The difference is highly reliable statistically and not attributable to chance. Moreover, other than chance fluctuations also appeared in individual induction centers. Analyzing the inductees received from one large center we found that for over a month the recruits examined on one certain day of the week, upon reexamination at Newport, contained only one-third of the number of misfits as the recruits examined on the other days in this center. Further investigation revealed that on this day there always was present, examining in the induction center, a voluntary unit led by one of America's leading neuropsychiatrists. Apparently error can be reduced by training and skill.

It is more difficult to estimate the error at the Naval training stations, since no reexamination was held at a later date, and subsequent neuropsychiatric casualty rates reflect the results of combat conditions as well as error in the training station examination. However, at Newport some 13% to 18% of the special order discharges for neuropsychiatric reasons represented men who were missed during the examination upon arrival at the Station, but who subsequently broke down during training[6]. This reflects the error in the original screening examination. Again, the wide differences in discharge rates between Naval training stations (in April, 1943 these ranged from 0.3% to 8.2% of the incoming recruits) also is in part a reflection of varying rates of psychiatric error, although it reflects local administrative pressures as well.

In January, 1944 when the U. S. Naval Training Station at Newport ceased to function as a recruit training center and became a pre-commissioning ship where crews for manning new ship construction were assembled, the Commanding Officer ordered a psychiatric examination of all men arriving at the Station. Since many of these were coming direct from recruit training stations, this reexamination offered a check upon the efficiency of the selection procedures at the recruit training centers. A statistical analysis during the months of April, May, and June, 1944 showed that of all men arriving at the precommissioning center from training stations, that training station having the smallest special order discharge rate was contributing the largest number of unfit personnel. It was necessary to reject at the precommissioning center 1.8% of the personnel arriving from this station, whereas only .4% of the personnel from the station with the largest special order discharge rate were being surveyed for neuropsychiatric reasons. The difference is highly reliable statistically.

Deliberate misses. Further error is introduced in the official figures by the deliberate practice of some psychiatric units of allowing certain handicapped individuals to continue in service despite their disability. We shall illustrate this from the field of mental deficiency. The discharge rate for mental deficiency is sometimes taken as a measure of the extent of feeblemindedness in the Naval service. Records of the Psychiatric Unit at Newport during the month of June, 1942, however, showed that approximately one-third of those demonstrable mental deficients who were detected were being passed to duty despite this handicap. Such an exercise of professional discretion where a recruit was adjudged to be of potential service to the Navy despite the existence of some demonstrable defect was common practice in military psychiatry. While the practice is understandable and often desirable, it does result in official incidence figures which are below the actual total existing in the service.

Misses attributable to the lack of any organized means of detection. Naturally, the true incidence of neuropsychiatric disorder cannot be accurately determined unless there is some means at hand for detecting it. This can be illustrated by some figures from the Newport Training Station. During the year 1940 with no psychiatrist on duty at the Station, the neuropsychiatric rejection rate was only 0.3%. With one psychiatrist reporting for duty in January 1941 and another psychiatrist and one psychologist reporting between then and May, the rate rose to 1.5%. With the institution of regular examination procedures by a complete unit the rate between May, 1941 and the outbreak of war rose to 3.8%. This experience was repeated at the other training stations. While psychiatric units were being organized and examining procedures were being worked out, the rejection rate was always low. With organization completed and examination procedures stabilized, the rate rose immediately. Moreover, at some stations a shortage of neuropsychiatric personnel combined with the tremendous inflow of recruits following the outbreak of hostilities made it necessary to substitute mass procedures for the individual examination, and in some instances even to suspend any examination for brief periods of time.

While the training station selection programs functioned relatively efficiently, reexamination facilities at later stages of service were never adequate. Reexamination at receiving ships of men returning from combat duty and reexamination at embarkation points and staging areas was always spotty and usually lacking until the later months of the war. Even then there never was sufficient psychiatric or psychological personnel to fill the demands for such service. Many a neuropsychiatric casualty was overlooked for want of a psychiatrist or psychologist to recognize him.

When the Newport Training Station became a precommissioning ship for gathering and training crews for new construction, the need for reexamination of those men who were coming from training stations, service schools, and many of them from previous sea duty was not foreseen. At the insistence of the commanding officer, however, the neuropsychiatric examining unit was continued and every incoming man received a psychiatric examination. From January 1 through May 10, 1944 of the some 12,000 men examined (representing the crews for 27 new ships) 1.7% were suffering from some neuropsychiatric difficulty severe enough to warrant medical survey from the service. Discharge rates for individual ships ranged from 0.3% to 3.6% of total complement. This story was repeated wherever psychiatric reexaminations were set up at receiving ships, embarkation centers, etc. One can only conclude that the actual incidence of personality disorders in the service was greater than was officially recognized.

Misses attributable to the absence of any available channel for disposal. It is not enough for a neuropsychiatric case to be recognized by a psychiatrist in order for it to appear in the incidence figures. The case must be referred to some treatment or disposal facility which makes an official census report. Thus it is not until the patient is admitted to a hospital and receives a medical survey, or is presented

before an Aptitude Board and receives a special order discharge that he becomes entered "officially" as a statistic. Where such channels for disposal are missing or limited, the patient may be recognized as unfit but may be retained in the service because it is impossible to get rid of him. Thus he never appears as a casualty in the neuropsychiatric statistics.

We must not overlook the fact that all special order discharges given by Aptitude Boards had to be approved by the commanding officer at the training station before becoming effective. By cooperating or not cooperating with the efforts of his psychiatric unit, the commanding officer was thus able to control the flow of special order discharges and hence to control the figures for the incidence of neuropsychiatric disability among his recruit population. Thus in the spring of 1943 with the overall recruit rejection rate for all stations averaging about 4.0%, only 0.3% of the recruits at the Sampson Training Station were being discharged. At first this looks as if the recruit population there was outstandingly superior, since an effective psychiatric unit was functioning at the time. The simple truth was, however, that the commanding officer was refusing to approve the recommendations of his Aptitude Board and thus concealing the true incidence of disability among the recruits. This situation continued for some while and completely distorts the statistics from this station.

During the existence of Newport as a training station its special order discharge rate ran consistently about 2% below that at the Great Lakes Training Station. This does not represent a true difference in the respective populations, but rather the refusal of the commanding officer at Newport to allow the discharge rate to rise much above 4%. At all times, the Navy's training station selection program represented a compromise between the judgment of the psychiatrists involved and the "attrition tolerance" of the line officer commanding the station. This resulted in an artificial lowering of the rates reported below the actual incidence of neuropsychiatric disorder. We can only conclude from the above evidence that here again were serious errors tending to reduce the reported frequencies of neuropsychiatric disorders in the armed forces.

False Diagnosis

Those errors produced by the assigning of a false diagnosis can in turn be subdivided into separate categories. The most obvious type of false diagnosis might be called the *simple mistake*. Allowing for some professional error, the psychiatrist may class as pathological some individual who is not ill, or he may attach the wrong diagnostic label to him. In another type of false diagnosis there is a deliberate error committed for some extraneous reason. These may be called *deliberate distortions*, and may occur for both *administrative* and *humane* reasons. Finally, some error seems introduced by *diagnostic fads and fashions*. Here the final diagnosis seems governed by some strong and specific custom or habit on the part of the local unit or individual psychiatrist. We will illustrate these below.

Simple mistakes. Remembering that many military psychiatrists were general medical men "converted" by short training courses, and remembering that often in the absence of a psychiatrist a general practitioner had to function in a psychiatric capacity, it is not surprising that mistaken diagnoses were sometimes assigned. One of the most dramatic of our experiences was a homicidal paranoid praecox who received a hospital diagnosis of hysteria and was returned to duty with disastrous consequences. The diagnosis of Combat Fatigue was perhaps the most widely misused, applied in practice to almost any type of psychopathosis which might appear. In an unpublished study of the Naval medical records of a large number of cases diagnosed as "combat fatigue," Commander Howard P. Rome found many of the patients had hallucinations and delusions listed among their symptoms. Obviously "combat fatigue" was being used erroneously to cover a psychotic episode. As one goes through the medical records of the neuropsychiatric casualties of the last war, many such cases of obvious misdiagnosis are encountered.

False positives. On one type of misdiagnosis, that of the false positive (a normal individual mistakenly called pathological) some estimates of error may be given. Working at great speed as the induction center psychiatric examiners did, and without the benefit of a complete case study, it was inevitable that many inductees should be falsely stigmatized as unfit for service. In the Navy all recruits adjudged unfit for duty during the brief initial psychiatric interview at the training stations were admitted to a psychiatric ward for further study before a special order discharge was recommended. The complete case work-up conducted in more thorough fashion on the observation ward frequently revealed that the original judgment of "unfit" was not justified and the man was then returned to duty. At the Newport Training Station the false positive rate of such men ultimately returned to duty averaged about one-third of all admissions to the observation ward or 2% to 3% of all incoming recruits examined[5]. Recently published figures on the work of the psychiatric unit at the Great Lakes Training Station, indicates that their rate for men returned to duty after careful reexamination and study averaged between 1% and 2% of all recruits examined[3]. While some of the false positives at the original induction center examinations were undoubtedly corrected by subsequent reexamination at some later call, there must have been thousands of relatively normal individuals falsely classified as unfit for neuropsychiatric reasons as a result of the brief induction examination.

Deliberate distortions. Some of the erroneous diagnoses were willful and deliberate distortions by the psychiatrist for either *humane* or *administrative* reasons. Such "humane" errors were often committed in dealing with homosexuals. The military services tended to treat all homosexuals alike, whether or not overt homosexual acts had been committed during service. Even the latent homosexual whose trends precipitated an anxiety or panic reaction but who was not actually indulging in homosexual practices was in danger of a discharge "without honor" if his basic condition was recognized and correctly described by a psychiatrist. In such cases it was common practice in both Army and Navy to protect the patient by concealing the basic condition. In our examination of thousands of medical records we have come upon many additional cases where despite a clear hospital record of mental disorder the final medical survey was based upon some physical condition, apparently in an attempt to avoid the stigma of a neuropsychiatric discharge. The outstanding example we have found was that of an enlisted man with an honorable record of several years of service including combat. Over the course of his last year of service this man has received medical attention several times and each time an entry was made of "psychoneurosis, anxiety" in his health record. Despite this he was finally discharged for "obesity," a condition first noted in the record at the time of final discharge.

Some deliberate falsifications of diagnosis were committed for administrative reasons. In the early days of the war when illiteracy was a cause for rejection in the Navy, many mental deficients were discharged as illiterates. The diagnosis of illiteracy is more easily established than that of mental deficiency, and it avoids the frequent administrative complaint that "there is a place for mental defectives in the Navy." A like situation existed where symptomatic diagnoses of somnambulism or enuresis were given without any attempt to establish the basic conditions responsible.

Before the war there was some prejudice both centrally in the Bureau of Medicine and Surgery and locally in the hospitals against medical surveys for neuropsychiatric conditions, whereas "organic" diagnoses were usually accepted. This led to a tendency in cases of incapacitating personality disorder of basing the necessary medical survey upon some attendant physical defect rather than upon the psychiatric symptomatology. A survey for "deviated nasal septum" had a much better chance of administrative approval than one of "psychoneurosis." This is illustrated in Table 1 which gives the data for 16 consecutive cases selected

TABLE 1. *A comparison of original diagnosis with final diagnosis given on medical survey*
(16 consecutive cases)

Original Diagnosis	*Surveyed as*
Psychoneurosis, unclassified	Deviation of nasal septum
Psychosis, unclassified	Syphilis
Dementia praecox, paranoid	Constitutional psychopathic state, inadequate personality
Epilepsy	Malocclusion of teeth
Psychosis, manic depressive	Varicocele
Dementia praecox	Deviation of nasal septum
Epilepsy	Displacement of metacarpal-phalangeal joint, left thumb
Dementia praecox	Dementia praecox, transferred to custodial care
Dementia praecox	Insufficiency of ocular muscle
Enuresis	Enuresis
Homosexuality	Syringitis
Dementia praecox	Constitutional psychopathic state, emotional instability
Epilepsy	Psychoneurosis, hysteria
Disseminated sclerosis	Enuresis
Constitutional psychopathic Inferiority, without psychosis	Deviation of nasal septum
Psychoneurosis, unclassified	Arterial hypertension

at random from the records of a naval training station. These were men seen at the training station sick bay during the spring of 1941. These men were all adjudged unfit for service, given a tentative neuropsychiatric diagnosis, and transferred to an adjacent naval hospital for disposition. It is significant that while the judgment of unfit for service was agreed upon in every case, the final reason given for medical survey from the hospital (as shown in Table 1) was usually for some physical condition. The distortion of official statistics by such practices is obvious.

Diagnostic fashions. A further source of erroneous diagnoses enters with the prevalence of local fashions or biases in diagnostic practice. A specific psychiatrist or local psychiatric unit may be predisposed toward the use of certain diagnostic categories and the neglect of others. Thus the final diagnosis in any particular instance may be a function of the diagnostic prejudices of the particular psychiatrist examining the patient rather than a direct function of the specific symptomatology present. This type of error is in large part responsible for the present lack of reliability in psychiatric diagnoses.

In surveying the relative incidence rates for the various neuropsychiatric disorders in numerous Naval installations, one is struck by variations which appear to be impossible for explanation in terms of a genuine variation in the nature of the samplings involved, and seem plausible only in terms of differing local diagnostic customs. One of the authors[2] has already pointed out differences of 800% in the relative incidence of psychoneuroses in random samplings of medical surveys from various Naval hospitals. Such differences also appear if one examines Naval training station selection figures. If we look at the figures for special order discharges from training stations for the month of April, 1943, we find that only 30% of the discharges from Great Lakes were for constitutional psychopathic state, but 60% of those from Farragut fell in this category. The incidence of psychoneurosis among total discharges at Great Lakes however, was 24% compared with 10% at Farragut. The relative number of discharges for mental deficiency at San Diego was 40% compared with 20% for Great Lakes, and only 2% for Farragut. Epilepsy claimed 14% of the diagnoses at both Newport and Sampson, but only 1% at Great Lakes and San Diego. Post traumatic

syndrome counted for 5% of the diagnoses at Great Lakes and 6% at Newport, but is not found among those from San Diego, Farragut, and Sampson. Somnambulism accounts for 9% of the discharges at Farragut, but none at Newport, San Diego, or Sampson. Illiteracy claims 11% of the diagnoses at Sampson, only 1% at Great Lakes and San Diego, and none at Farragut.

Another sampling from the training stations (for the month of May, 1945) shows that at this time only 2% of the discharges from Great Lakes were for psychoneuroses, while this diagnosis was given in 60% of the discharges from San Diego; 52% of those at Great Lakes were for personality disorder, however, with only 34% attributed to this at San Diego. Mental deficiency occurs in 10% of the cases at Great Lakes and Sampson, but in only 1% of the cases at Bainbridge and San Diego. It does not seem that these differences can plausibly be explained wholly in terms of genuine differences in the recruit population sampled. Diagnostic preferences must be operating to distort the real picture.

Sampling Errors

Statistical pitfalls, however, are not limited to the above problems of erroneous diagnosis. Many concern the nature of the samplings, or groups, from which conclusions may be drawn. If our statistics are to permit adequate inferences to be made, the group or sampling on which they are based must be numerous enough to allow for statistically valid conclusions, the sampling must be representative of the total population about which the inferences are made, and we must adequately define the nature of the sampling and not make erroneous assumptions about any of its important characteristics. These three types of "sampling" error may all lead to false conclusions.

No hard and fast rules can be set up for the *size* of an adequate sample. Unfortunately the real populations from which our samples are drawn are never the ideal populations of theoretical statistics, and our "random" sampling techniques, try as we do, are frequently contaminated by unknown selective factors. The authors have found it best to proceed empirically, extending samples wherever possible until further additions produce relatively little fluctuation in the variable under study. In one study of a relatively homogeneous population of 1169 Naval recruits at the Newport Training Station, samples of approximately 250 seemed sufficient[7], but a recent unpublished study of subsequent neuropsychiatric attrition among the recruits trained at another station during the month of April, 1943 showed a discharge rate of only 0.4% for the first sample of 247 recruits and a rate of 1.7% for a further sample of 1278. While the difference between these samples is not statistically significant (there is one chance out of ten that it could have occurred by chance alone), it is obvious that in this case the smaller sample does not give an accurate description of the total sampling of 1525 with an attrition rate of 1.5%. Again, while the difference is not statistically significant, it could cause some embarrassing consequences in medical planning if the smaller group were assumed to be representative of the larger one.

Unfortunately the accepted rules of statistical probability also may lead us astray. Thus many experimental investigators would accept an obtained difference between groups as significant if it reached the 5% level of significance (only one chance out of 20 that purely chance factors were responsible for it), and would then assume they could draw "valid" conclusions from the data. But that difference *will* occur one time out of 20 by chance alone! We have recently obtained a random sampling of 500 recruits from all Naval training stations during 1944. This was then split into two groups of 250 each by the random procedure of removing every other name in the original list. The attrition rates for each of the smaller groups were then ascertained and showed a difference of 0.8% to 3.2% which is significant at the 5% level of confidence, but which is produced here by chance selection alone. These possibilities should be kept in mind in handling our statistics.

A further error may occur when the assumption is made that the sample from

which our inferences are to be drawn is representative of a larger population to which the inferences will then be applied. This assumption always needs careful checking. Suppose we assumed that a large random selection of Naval recruits would be representative of the total male population of the United States within a comparable age range, and then proceeded to measure the distribution of intelligence within our recruit sampling in order to draw conclusions concerning the intelligence of the population as a whole. Unfortunately our distribution of recruits is not completely representative of the population at large as it is truncated at the lower end by our induction center and training station selection procedures which tend to screen out from the recruit group many of the mental defectives found in the total population. Such truncation also may take place at the high end of the distribution for intelligence owing to officer selection procedures, but this is more difficult to establish. For many purposes the error introduced may be small and insignificant, as one of the authors has found in his studies on intelligence test validation. If, however, one were to draw conclusions from the recruit sampling concerning the incidence of mental deficiency or "genius" in the entire population of the country, the error would be serious and would render the conclusions invalid.

Finally, we must be very careful about attributing to our sample groups characteristics which we assume to be present but whose presence we have not adequately demonstrated. For instance, in comparing the military performance of groups of white and negro recruits, the assumption is often made that the groups are in many ways comparable since both were submitted to the same selection procedures. A study by one of the authors has demonstrated that this assumption is unwarranted and that selection standards in the Navy were lower for Negroes than those for whites, resulting in a higher incidence of mental deficiency among the Negro group[1]. Nor can we assume an equal educational background for the two groups. Of the recruits entering the Navy from July, 1943 through September, 1944 (where information concerning education was available) recruits who had completed high school were three times as numerous among the white groups, and illiteracy was twice as prevalent among the Negro group.

Sometimes assumptions concerning the characteristics of a military group are erroneous because they are based upon a false criterion. Thus in the early days of the war it was often assumed that low scores on the Navy General Classification Test were indicative of mental deficiency. Men scoring below a certain critical point (previously ascertained on a peace-time population to be equivalent to an intelligence quotient of 70) were referred to a psychiatric unit for further examination. A regular check instituted on these low scoring men at the Newport Training Station during the first six months of 1942 showed that mental deficiency accounted for never more than 20% of the low scores. The rest were attributable to educational handicap, poor test motivation, and the existence of handicapping personality disorders or some basic psychopathosis.

In conclusion, there is one final source of error not categorized above which should be mentioned despite its humble nature. This is simple *clerical error*. It must be remembered that while a responsible medical officer was the source of each individual diagnosis, the entering of that diagnosis in the health records and the tabulation of many of the statistical reports forwarded to official Washington was done in the field by relatively untrained clerical personnel. The Navy before the war had the idealized conception of the hospital corpsman as combination medical assistant, administrative officer, and expert stenographer. With the advent of hostilities and the attendant tremendous increase in paper work, many of the new personnel were unable to live up to these demands and more than one field unit came to the brink of clerical disaster before the situation was realized and corrected. Even so, clerical staffs were seldom sufficient for the tasks demanded of them and a great deal of error resulted. Moreover, some of the field personnel responsible for gathering sta-

tistics and preparing reports caught the spirit of the thing and made a personal competitive effort not in accord with strict scientific objectivity. As an ex-Army corpsman in charge of venereal statistics for a large unit recently stated to one of us, "If you liked the officer in charge, you made his record look good; if you didn't, you knifed him. I hope you fellows don't trust those figures too far." While the general situation was understandable and perhaps unavoidable, it does not add to our confidence in military statistics.

Summary and Conclusions

The cumulative effect of the picture presented above is a grim one. Some of the errors mentioned, of course, are familiar ones in civilian mental hygiene figures, and neither seem to have completely robbed these figures of their value nor to have discouraged the hardy researchers who use them. There seems little doubt, however, that these errors are magnified in military statistics and that the military situation has added some new ones of its own. Nevertheless, error that can be recognized and located can be compensated for, at least in part. The errors mentioned above vary in significance, in distribution, and in quantity. Some can be measured, and statistical corrections then made. Those that cannot, can at least be taken into account rationally with a resulting delimitation of the inferences drawn from them. The picture, while grim, is not hopeless.

In their statistical research on Naval neuropsychiatric practices, the present authors have adopted the policy of concentrating on materials from known sources, where they are familiar with the professional training and practices of the personnel involved, and the particular situational demands and administrative framework within which they functioned. Experimental samplings of recruits handled in these known situations are then obtained and direct recourse is had to the medical and service records of the men involved. All available internal and cross checks are introduced, and the final results are interpreted with caution.

It is not to be expected however, that such complete information will be available to everyone interested in using military neuropsychiatric statistics. Careful observance of approved sampling and statistical procedures will be helpful, as well as a careful and cynical searching of the resulting data, with all the sources of error constantly in mind. Cautious conclusions may then be indicated; but without such caution the way will be wide open for unwarranted and invalid generalizations whose acceptance may be followed by immediate social harm as well as ultimate professional embarrassment.

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OBSERVATIONS ON TACTUAL FORM PERCEPTION (STEREOGNOSIS) IN PRESCHOOL CHILDREN

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Introduction

By stereognosis is meant the ability to recognize an object solely by means of the mechanisms of active touch, without the aid of vision. This psychoneurological function has received relatively little attention from psychologists but simple tests of the capacity have long been included in the diagnostic armamentarium of the neurologist. In clinical neurology, *astereognosis, i.e.*, impairment of stereognostic capacity in the presence of a grossly adequate sensory substrate,[1] in either hand is considered as evidence of a central nervous system lesion, usually (but not always) one affecting the post-central gyrus of the contralateral cerebral hemisphere[1, 3, 4, 8, 9].

The usual procedure in the neurological examination is to have the patient close his eyes and to place in the palm of his hand some object (key, coin, pencil, etc.) to be identified. Under these conditions of testing with commonly used and handled objects, it is found that there is virtually no variability in performance in the normal population and that the finding of a defect in this capacity in an adult subject is an almost certain indication of organic disturbance of the central nervous system, providing that hysteria and malingering can be excluded as possibilities[2, 6, 10]. The same lack of variability holds for children of school age who are not grossly defective mentally and here too the finding of a defective stereognostic capacity is of clinical significance. The question of how far down the age scale one may go and still be safe in assuming virtually perfect capacity with respect to the recognition of the usual test objects is one which has not been systematically investigated. It is this question with which the writers have been concerned. Their concern is derived from an interest in the general problem of the detection and evaluation of cerebral dysfunction in children and in the possibility of utilizing assessments of certain psychoneurological functions for this clinical purpose.

1. It is not necessary to enter here into the controversy as to whether astereognosis necessarily involves impairment in one or more of the supposedly "simpler" sensory performances, as long as it is clearly recognized that by "astereognosis" is meant a disability which is *not* a direct consequence of gross sensory loss such as a significant hypesthesia resulting from peripheral nerve or spinal cord injury. For details of this controversy, see the papers of Cohen[5] and Lange[7].

Methods

Subjects. The population studied consisted of 156 children, 92 boys and 64 girls, ranging in age from 3 years, 0 months to 5 years, 10 months. There were three groups of children in this population. One was a group of 82 children attending a public kindergarten selected because it drew children from a neighborhood considered to be fairly representative of the total population of the city of Louisville. A second group consisted of 32 children attending a preschool catering to families of average socio-economic status. The third group consisted of 42 children attending a preschool catering to families of somewhat above average socio-economic status. No attempt was made to ascertain the intelligence levels of the individual children. There were almost certainly no significantly retarded children (*i.e.*, below IQ 80) in this population. In the third group there was probably a disproportionate number of children of superior intelligence.

Materials. On the basis of preliminary experimentation with 20 test objects, two series of 8 objects each were assembled, these series consisting of objects which had been found to be equivalent in difficulty value. The two series of objects, hereafter designated as Forms A and B, were as follows:

Form A

1. A rubber ball, ca. 2½ inches in diameter.
2. A metal table fork of the usual size.
3. A sharpened pencil, ca. 5 inches in length.
4. A toy ring with a simulated gem attached to it.
5. A toy plastic straight-backed chair, ca. 3 inches in height.
6. A pair of children's sun-glasses.
7. A Yale type key.
8. A plastic drinking cup with handle, ca. 2½ inches in diameter and 3 inches high.

Form B

1. A metal teaspoon of the usual size.
2. A plastic comb, ca. 7 inches in length.
3. A metal table knife of the usual size.
4. A cardboard box with cover, ca. 4″ x 5″ x 3″.
5. A stiff-covered book, ca. 5″ x 7″ x 2″.
6. A water glass of the usual size.
7. A toy plastic table, ca. 4″ x 4″ x 3″.
8. A penny.

A wooden box, 14″ x 8″ x 8″, from which the front and back sides had been removed and to the front side of which a curtain had been attached was used for the testing. The experimenter would insert an object through the open back of the box and the child would feel the object without seeing it by inserting his hand under the curtain on the front side. The total effect was somewhat like that of a Punch-and-Judy stage. This procedure was employed in preference to the usual exploration with eyes closed both because it appealed to the children as a game and because it was felt that the necessity of closing their eyes might engender anxiety in some children.

Administration. The procedure in testing was as follows: The session was usually started by playing "catch" with the children which served both to establish rapport and to indicate arm preference in throwing. The child was then invited to draw pictures with the experimenter and hand preference in drawing was noted. Following this the various test objects were brought out and the child asked to name them. If he could name them correctly the stereognostic test was given. The test objects were removed from sight and the child requested to insert *one* hand in the box, to feel the test object and tell what it was. In most cases, the child was made to insert the same hand for both Form A and Form B. In a few cases, one hand was used for one form of the test and the other hand for the other form. In no case was the child permitted to insert both hands to feel an object.

Test "score" on each of the forms was the number of correct identifications. Thus the possible range of scores was 0 to 8. The response, "money," as an interpretation of the penny was counted as a correct identification.

Results

Comparative analysis of the data indicated no significant or consistent differences in the performances of boys and girls or of right-handed or left-handed children (hand preference being defined by the performances in drawing and

Table 1. *Distribution of stereognosis test scores of children within the age range 5 years to 5 years, 10 months.* $N = 100$

	Preferred hand			*Non-preferred hand*		
Score	$N = 41$ *Form A*	$N = 41$ *Form B*	$N = 40$ *Ave. both forms*	$N = 59$ *Form A*	$N = 59$ *Form B*	$N = 58$ *Ave. both forms*
8.0	20	16	7	19	18	8
7.5	..	..	18	..	..	16
7.0	15	17	6	24	27	14
6.5	..	..	4	..	..	11
6.0	2	5	3	13	12	7
5.5	..	..	2	..	..	2
5.0	3	2	..	2	2	..
4.5	..	..	..	..	..	..
4.0	1	..	..	1	..	..
3.5	..	..	..	..	..	..
3.0	..	1	..	..	..	..
Mean score	7.22	7.07	7.20	6.98	7.03	7.01
SD	.99	1.06	.68	.93	.84	.65

throwing). For this reason the data for both sexes and for both right-handed and left-handed children are treated as a unit in this report.

Five-year-old children. Table 1 shows the distribution of test scores of 100 children who were within the age range 5 years to 5 years, 10 months. It will be noted that there were no significant differences in stereognostic capacity in the preferred hand as compared with the non-preferred hand. The great majority of children achieved a score of at least 7 and a substantial number made perfect scores. No child made a score of less than 5.5 when the scores for the two tests are averaged. There were 3 children who made relatively poor performances on one form of the test but who did well on the other form of the test.

J.B., girl, age 5 yrs., 6 mos., right-handed, made a score of 4 (succeeded in identifying correctly only half the test objects) on Form A, using the *right* hand. On Form B, she made a score of 8, using the *right* hand, average score on both tests being 6.

B.G., boy, age 5 yrs., 0 mos., right-handed, made a score of 4 on Form A, using the *left* hand; using the *left* hand on the test objects of Form B, he made a score of 7, failing to identify the penny. Thus average score on both test forms was 5.5.

J.L., boy, age 5 yrs., 0 mos., right-handed, made a score of 8 on Form A, using the *right* hand. However, on Form B, using the *right* hand, he made a score of only 3, average score on both tests being 5.5. It is possible that fatigue or a lack of interest may account for this rather sudden decline in performance level but there is no positive evidence for this. He was overtly cooperative throughout the testing period.

On the basis of these data, the following procedure and criteria have been adopted in our clinical work with children of this age group. If a child makes a score of 6-8 on one form of the test, stereognostic capacity in the tested hand is considered to be within normal limits. If his score is less than 6, he is retested with the same hand on the other form of the test. If average score is 5.5 or greater (which indicates that he must have achieved a score of at least 6 on the second form), stereognostic capacity in the tested hand is considered to be within normal limits. If average score on both tests is less than 5.5, stereognostic capacity in the tested hand is considered to be significantly defective.

Four-year-old children. Table 2 shows the distribution of test scores of 34 children who were within the age range of 4 years to 4 years, 11 months. It will be

TABLE 2. *Distribution of stereognosis test scores of children within the age range 4 years to 4 years, 11 months.* $N = 34$

	Preferred hand			*Non-preferred hand*		
Score	$N = 14$ *Form A*	$N = 14$ *Form B*	$N = 11$ *Ave. both forms*	$N = 19$ *Form A*	$N = 19$ *Form B*	$N = 16$ *Ave. both forms*
8.0	5	2	1	6	4	1
7.5	..	..	2	..	..	4
7.0	3	7	2	6	8	4
6.5	..	..	2	..	..	5
6.0	2	2	2	3	4	..
5.5	..	..	..	..	..	..
5.0	3	1	..	2	3	1
4.5	..	..	1	..	..	1
4.0	1	2	1	1	..	..
3.5	..	..	..	..	..	..
3.0	..	..	..	..	..	..
2.5	..	..	..	..	..	..
2.0	..	..	..	1	..	..
Mean score	6.57	6.43	6.41	6.53	6.68	6.75
SD	1.36	1.23	1.18	1.55	1.00	.88

noted that, as is the case with the older children, there is no significant difference in stereognostic capacity in the preferred hand as compared with the non-preferred hand. The scores in general are slightly lower than those of the five-year-old group with a greater spread of scores in the younger age group (Cf. *SD*'s). A substantial number of four-year-olds make perfect scores on the test. On the other hand, low scores which do not occur at all in the older age group are made by some of the four-year-olds.

G.T.B., boy, age 4 yrs., 1 mo., right-handed, made a score of only 2 on Form A when using his *left* hand. On Form B, using his *right* hand, he made a score of 5.

N.G., girl, age 4 yrs., 7 mos., a prematurely born twin, right-handed, made scores of 4 on both forms of the test, using the *right* hand. C.G., her twin sister, right-handed, made scores of 7 and 8 on the test, using the *left* hand.

On the basis of these data, the following procedure and criteria have been adopted in our clinical work with children of this age group. If a child makes a score of 5-8 on one form of the test, stereognostic capacity in the tested hand is considered to be within normal limits. If his score is less than 5, he is retested with the same hand on the other form of the test. If average score is 4.5 or greater (which indicates that he must have achieved a score of at least 5 on the second form) stereognostic capacity is considered to be within normal limits. If average score on both tests is less than 4.5, stereognostic capacity is considered to be significantly defective.

Three-year-old children. Table 3 shows the distribution of test scores of 22 children who were within the age range of 3 years to 3 years, 11 months. It will be noted that, as is the case with the older age groups, no significant differences in stereognostic capacity between the preferred and non-preferred hands are apparent. The test scores are in general slightly lower than those of the 4-year-old group and definitely lower than those of the 5-year-old group.[2] The spread of scores is about the same as that of the 4-year-old group and somewhat greater than that of the 5-year-old group (Cf. *SD's*). In contrast to the older age groups, perfect scores are infrequent. Extremely low scores (below 4) on one of the tests were made by two children.

2. When the average scores on both tests for both the preferred and non-preferred hands in the five-year-old group are combined, the mean score of the 98 children is 7.09, $SD = .69$. When the average scores on both tests for both the preferred and non-preferred hands in the three-year-old group are combined, the mean score of the 15 children is 6.26, $SD = 1.15$. The difference between these means approaches statistical significance ($CR = 2.5$).

TABLE 3. *Distribution of stereognosis test scores of children within the age range 3 years to 3 years, 11 months.* $N = 22$

	Preferred hand			*Non-preferred hand*		
Score	$N = 10$ *Form A*	$N = 11$ *Form B*	$N = 8$ *Ave. both forms*	$N = 10$ *Form A*	$N = 9$ *Form B*	$N = 7$ *Ave. both forms*
8.0	..	2	..	1	2	1
7.5	..	..	2	..	..	..
7.0	5	2	1	3	4	2
6.5	..	..	2	..	..	1
6.0	1	4	1	3	..	..
5.5	..	..	1	..	..	2
5.0	4	2	..	..	1	..
4.5	..	..	..	..	..	..
4.0	..	..	1	2	2	1
3.5	..	..	..	..	..	..
3.0	..	1	..	1	..	..
Mean score	6.10	6.09	6.31	5.80	6.33	6.21
SD	.94	1.38	1.10	1.54	1.50	1.23

C.R., girl, age 3 yrs., 8 mos., right-handed, made a score of 3 on Form A when using her *left* hand. On Form B, using her *right* hand, she made a score of 5.

J.S., boy, age 3 yrs., 8 mos., right-handed, made a score of 5 on Form A when using his *left* hand. Retested with the *left* hand on Form B, he made a score of only 3.

On the basis of these data on the 3-year-old children, the following procedure and criteria have been adopted in our clinical work with this age group. If a child makes a score of 5-8 on one form of the test, stereognostic capacity in the tested hand is considered to be within normal limits. If his score is less than 5, he is retested with the same hand on the other form of the test. If average score is 4 or greater (which indicates that he must have achieved a score of at least 4 on the second form), stereognostic capacity is considered to be within normal limits. If average score on both tests is less than 4, stereognostic capacity is considered to be significantly defective.

Discussion

The data indicate that, under the specific conditions of testing of tactual appreciation utilized in this investigation, stereognostic capacity shows some growth in the age range of 3 years to 6 years. It would therefore be fallacious to assume virtually perfect capacity for this type of tactual recognition in normal children under the age of 6 years. It is also evident from the data that stereognostic capacity extends back into very early childhood and in all probability antedates the motor language skills involved in naming visually perceived objects. Two 3-year-old children were encountered whose naming of objects upon visual presentation was sufficiently unstable to preclude giving them the stereognosis tests. Among the 2-year-old children (all of these being within the age range 2 yrs., 6 mos. to 2 yrs., 11 mos.) whose naming of visually perceived objects was explored there were several who showed considerable instability, sometimes being able to name the object, sometimes failing to name it. Although the other 2-year-old children consistently named the objects correctly, it was felt that the object naming skills in this age group were in general not established with sufficient security to warrant administration of the stereognosis tests even to these 2-year-old children. For this reason, testing was not carried below the 3-year age level. Obviously, in clinical work with children under the age of 3 years, relative success on the test will indicate that stereognostic capacity is not impaired. However, the interpretive value of defective performances of two-year-old children would be, we feel, rather uncertain because of the possibility that the unusual task of having to identify an object tactually without the aid of vision might adversely affect responses dependent upon insecurely established motor language mechanisms. A non-verbal form of the test wherein the child is requested to match the tactually perceived object with one in a group of visually presented objects or pictures might be contrived for use with two-year-old children. Such a non-verbal form of the test would have the additional advantage of being utilizable with brain-injured children of any age who suffer from motor language disabilities.

Summary

1. A series of test objects designed to assess tactual form perception (stereognosis) in pre-school children is described and normative data on the performances of children within the age range 3 years to 6 years are reported.

2. Under the specific conditions of testing utilized in the present investigation, stereognostic capacity shows some growth within the age range 3 years to 6 years.

3. The clinical implications of the findings are discussed and normative standards for clinical use in the assessment of stereognostic capacity in brain-injured children are presented.

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THE ANALYSIS OF STRUCTURED CLINICAL INTERVIEWS

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INTRODUCTION

For many years, psychologists and psychiatrists who have used clinical interviews in research have faced the problem of reducing the qualitative data which such procedures make available to a limited number of categories so that the data could then be handled in some roughly quantitative manner. On the one hand, researchers face the possibility of losing the value of the clinical interview as a projective device rich in idiosyncratic meanings, and on the other hand, there has frequently been a pressing need for inter-interview comparisons useful in research. This paper is a report of attempts to analyze a series of forty-eight Guided Clinical Interviews by means of a series of evaluation categories derived from a variety of sources. The research reported upon is from a larger project undertaken for the Office of Naval Research under the supervision of the author[5]. The specific statistical methods used in the handling of the categorized data are to be made available in another publication, but it is apparent that a number of different methods are possible.

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The opinions and assertions contained herein are the private ones of the writer and are not to be construed as official or as reflecting the views of the Navy Department and the Naval service at large.

METHOD

Subjects. The subjects used in the research were above-the-knee male amputees all of whom were veterans of World War II. These men were of various socio-economic levels, educational backgrounds, and occupations. Each man was studied by means of a comprehensive personality assessment battery which, in addition to the Guided Clinical Interview, consisted of the Rorschach Test, the Thematic Apperception Test, the Seitz-McFarland Psychosomatic Inventory, the Bell Adjustment Inventory, an Open-End Attitude Scale, a Biographical Information Blank, the Wechsler-Bellevue, and a figure drawing test. This paper is concerned only with the Guided Clinical Interview and its method of analysis.

The Guided Clinical Interview. The primary purpose of the Guided Clinical Interview (GCI) was to collect personality data about the subject which were not available from other sources. A secondary function was that of providing information which could be used to check projective and non-projective data provided by the other instruments in the assessment battery. The interviewers, who were experienced clinical psychologists,

sought to play the role of participant-observers in which their skills in listening appreciatively were foremost in importance.

The interviews themselves were structured around the needs of the research to have comparable data emerge from the GCI for subsequent analysis. Accordingly, a procedure recommended by Merton[4] was utilized:

1. All subjects interviewed were known to have been involved in a *particular kind of concrete situation*—the loss of a lower extremity.
2. On the basis of the Biographical Information Blank and the testing instruments, an analysis of the hypothetically significant elements, behavior patterns, and the total situation as they may have affected the subject was made. By means of *content analysis* of this information, the interviewer tried to formulate a set of hypotheses concerning the meaning of the amputation and the subject's reactions to it and the partial disability it forced upon him.
3. Using this for preliminary analysis, the clinical psychologist developed a brief *interview guide* which set forth the chief areas of inquiry and hypotheses for guiding the interview.
4. The interview sought, now through directive, now through non-directive, techniques to focus itself upon the *subjective experiences* of the interviewee which may be related to the development of his present attitudes.

The use of such procedures resulted in forty-eight interviews ranging from about forty minutes to two hours in duration. The average interview was approximately one hour in length, and consisted principally of the subject's verbalizations which were guided and directed, as necessary, by the interviewer. Insofar as possible, direct and leading questions were generally avoided, although the extent to which this was possible naturally differed from one subject to another. Judged along a continuum between direction and non-direction, the majority of the GCI were undoubtedly more directive than non-directive.

All forty-eight subjects were interviewed over a period of about six months by three different clinical psychologists, who divided the group roughly among themselves. The interviewers were in agreement that successful Guided Clinical Interviews of the kind sought were not, and could not be, the automatic results of conforming to a mechanically fixed routine of applicable techniques. We believed, on the contrary, that the interviews were, for the most part, constructive inter-personal situations for both interviewer and interviewee.

Analysis of Interviews. Because of the fact that the focus of the research was on group trends rather than on the single case, the standardization of a procedure for the evaluation of clinical interview data became very important. Moreover, in view of the fact that three clinical psychologists independently evaluated the forty-eight Guided Clinical Interviews, it is apparent that some more or less formalized procedure was both necessary and desirable. It should be pointed out that all interviews were recorded with a considerable degree of fidelity and with the full knowledge and permission of the subject who was assured, of course, that the information discussed would be kept confidential. It was decided not to transcribe the recordings because of the possibility of losing thereby the nuances and subtleties of expression which had been faithfully recorded. It was appreciated from the beginning that it was not likely that all of the nuances of the subjects' attitudes and feelings could be reduced to a limited number of categories which could be fully and readily agreed upon. But an earnest effort was made to get as much qualitatively from each GCI as possible and to categorize this material.

The three clinicians who analyzed the GCI's were instructed to follow a manual which had been prepared by the senior investigator so that roughly comparable procedures would be used. In the use of the manual, each psychologist was asked to employ his "clinical judgment" or "clinical insight" as much as possible. The following was the recommended procedure, which was on the whole complied with:

1. Listen to the interview as a whole, writing down any hypotheses you can about the subject's personality.
2. Relisten serially to portions of the interview as it unfolds, seeking evidence to support or refute previously developed hypotheses and to develop new hypotheses.
3. Review the entire structure of hypotheses formulated, using if possible a wider and

TABLE 1. *Guided clinical interview evaluation categories.*

	+2	+1	0	−1	−2
1.10 ATTITUDES TOWARD PARENTS					
1.11 Objective appraisal of parents—conventional idealization: overestimation of qualities and status of parents.					
1.12 Objective appraisal of parents—underestimation of characteristics of parents.					
1.13 Fairly treated by parents—victimized by parents: feelings of resentment and hostility toward parental figures, expressed in such terms as neglect, unjust discipline, etc.					
1.14 Genuine positive affect for parents, by reference to favorable characteristics of parents—genuine negative affect toward parents, by reference to unfavorable personal characteristics of parents.					
1.15 Independence of parents for material things—dependence on parents for material things.					
1.16 Non-submission to parental authorities and values—submission to parental authorities and values, based on fear or dependency.					
1.17 Warm, demonstrative father—stern, distant father.					
1.18 Warm, demonstrative, affectionate mother—cold distant mother.					
1.20 ATTITUDES TOWARD SIBLINGS					
1.21 Acceptance—rejection.					
1.22 Genuine rivalry toward siblings—little evident rivalry toward siblings.					
1.23 Status determined by siblings—status not apparently determined by siblings.					
1.30 ATTITUDES TOWARD CHILDHOOD					
1.31 Discipline which can be assimilated—discipline threatening, traumatic, overwhelming.					
1.32 Discipline for violation of principles, rationally explained—discipline for violation of rules, primarily moralistic.					
1.33 Happy childhood—unhappy childhood.					
1.34 Conforming behavior—uncomforming behavior.					
2.0 ATTITUDES TOWARD PEOPLE IN GENERAL					
2.1 Close—distant (relationships).					
2.2 Many—few (relationships).					
2.3 Equal—inferior.					
2.4 Equal—superior.					
2.5 Approval—disapproval.					
2.6 People essentially good until proved otherwise—distrust and suspicion.					
2.7 Relates easily to others—relates to others with difficulty.					
2.8 Fairly treated by others—victimized by others.					
2.9 Independent of others—dependent on others.					
3.0 ATTITUDE TOWARDS SEX					
3.1 Acceptance and participation—over rationalization and over compensation.					
3.2 Acceptance—inadequacy.					
3.3 Strong masculine identification and strivings—weak masculine identification and strivings.					
3.4 Fusion of sex and affection, personalized sex orientation—sex versus affection, depersonalized sex relations or interests.					
3.5 Genuine respect, fondness for opposite sex—underlying disrespect, resentment toward opposite sex.					
3.6 Love—seeking (warmth and affection)—power-orientation, exploitative-manipulative attitude based on concrete benefits.					

TABLE 1 (*continued*)

		+2	+1	0	—1	—2
4.0	ATTITUDES TOWARD SELF					
4.1	Objective self-appraisal — self-glorification (positive traits mentioned and negative traits rationalized).					
4.2	Self-acceptance—self-rejection (self-contempt).					
4.3	Social-psychological explanation of self—denial of genuine dynamics (explanation of self in terms of such factors as heredity, physical status, injury, etc.).					
4.4	Conventional moralism: honesty, high ideals, self-control—fallibility of self-control.					
4.5	Regards himself as the same as other persons—different from other persons.					
4.6	Continuity between childhood-self and present-self—discontinuity between childhood-self and present-self.					
5.0	ATTITUDES TOWARD INJURY					
5.1	Acceptance of injury—non-acceptance of injury.					
5.2	Ego status intact in spite of injury—ego status impaired because of injury.					
5.3	Resentment toward no one by reason of injury—resentment toward others because of injury.					
5.4	Level of aspiration consistent with injury—level of aspiration not consistent with injury.					
5.5	Does not "trade on" injury—tends to "trade on" injury.					
5.6	Injury less serious than might have been the case—injury over-whelmingly more serious than other war-connected injuries.					
6.0	VALUE ORIENTATION					
6.1	Independence—dependence.					
6.2	Strong achievement—weak achievement.					
6.3	Dominance—submission.					
6.4	Strong social recognition—weak social recognition.					
6.5	Good intelligence—poor intelligence.					
6.6	Good appearance—poor appearance.					
6.7	Strong self-regard—weak self-regard.					
6.8	Flexibility—rigidity.					

wider basis for inference with respect to each hypothesis.

4. On the basis of the limited number of hypotheses which emerge and which you feel can be sustained, fill in the Check Sheet for Guided Clinical Interview Analysis. Return, as necessary, to the actual GCI for needed evidence to support personality formulations finally developed.

In the evaluation of the GCI, the clinicians strove to develop a synoptic type of analysis in which they utilized evidence for or against each scoring category wherever it was found in the GCI. In general, there was no piece-meal evaluation of the interview.

The categories used for evaluation appear in Table 1 below. Each category was rated by each of the three psychologists independently according to a five-point scale: +2, +1, 0, —1, and —2. The Plus score did not mean a commitment by the clinician making the evaluation to a positive value orientation, and indicated simply that the evaluator found evidence in the GCI which clearly supported the scoring of the first polar alternative of the category. The Minus score, on the other hand, indicated that the clinical interview provided data which just as clearly supported the opposite polar alternative of the category. The digits, 1 and 2, whether positive or negative, were used to offer a rough indication as to the strength with which, in the evaluator's judgment, a given polar alternative could find support among the interview data taken as a whole. Thus, in item 1.16 of Table 1, a +2 would mean that strong support existed in the interview data for the statement that the subject was regarded as not submitting himself to parental authorities and values. In a like manner on the same item, —1 would suggest that moderate evidence could be

found in the GCI for the inference that the subject tended characteristically to submit to parental authorities and values, based either on his fear of or dependency upon his parents, or both. The Neutral score involved two possibilities: (1) that the existing evidence from the interview was too colorless or too self-contradictory to support the scoring of either of the two polar alternatives, or (2) that there was *no* evidence at all in the GCI which could be regarded as pertinent to the category in question. In practice, the categories which are chiefly factual in nature were those which were most often scored with a neutral rating.

Some comment with respect to the items contained in Table 1 is in order. As pointed out previously, the items are drawn from a number of sources, chief of which is the work of Frenkel-Brunswik, Levinson, and Sanford[2]. Our indebtedness to these workers is very great. Other items have been derived from both psychological theory and clinical psychological practice. The decision to develop the categories around polar opposites was made on the grounds that such a procedure would help focus the thinking of the evaluator, although no assumption was made or implied that the personality structure of any subject had to fit into the unrealistic dichotomy provided by the rating blank. The evaluation categories used in the rating blank actually permitted us to analyze most of the qualitative material contained in our forty-eight Guided Clinical Interviews. That this was possible is in part a tribute to the fact that the categories chosen appear both valid and useful for the type of interview analysis attempted.

It is essential to point out that Section 5.0 of the rating blank deals exclusively with categories appropriate to individuals with physical injuries, such as our amputees. For general use with non-injured persons, certain modifications or omissions would be necessary.

Section 6.0 on Value Orientations attempted an evaluation of the individual in terms of what appeared to be his chief value orientations and strivings. This section provided the evaluator with an opportunity of including potentially significant personality information which did not fit into any of the other categories.

It is, of course, apparent to the reader that the level of analysis of clinical interview data will be dependent upon the research or clinical needs of the psychologist. Most of the items contained in the method of evaluation which we used deal with data which are largely manifest in nature, although it should be emphasized that the materials in the interviews were not transparent. We believe, however, that such a procedure as we have used in our study is somewhat less applicable with interview or projective data of chiefly symbolic content. Indeed, one wonders to what extent, prior to an acceptable and all-embracing theory of personality, it may become possible to analyze large numbers of symbolic data from different interviews with any degree of success and confidence in the results.

Results

Table 2 summarizes the results of using the Guided Clinical Interview Rating Blank with our forty-eight subjects. The data are presented for each subject for each of the five principal evaluation categories as used by the three clinical psychologists. The data reported in Table 2 are those which resulted from arithmetically adding the various rating scores from the three clinical psychologists who evaluated the GCI's in accordance with the procedure outlined. For example, with three raters, the total positive rating for Section 1.10 would be 90; actually, Subject No. 1 received only 16 plus. In a like manner, the total negative rating possible would be 90 with three raters; Subject No. 1 actually received a minus rating of 5.

In interpreting Table 2, the reader should understand that in actual interpretation of the rating blank with our subjects, a considerable number of zero scores of indeterminate meaning resulted. The data presented in Table 2 do not include such material, and all of the items in each of the five major subsections of the rating blank have simply been arithmetically added to yield the figures which appear in the above table.

TABLE 2. *Guided clinical interview ratings on principal categories for forty-eight subjects*

Subject number	1.0 Attitudes toward family		2.0 Attitudes toward people in general		3.0 Attitudes toward sex		4.0 Attitudes toward self		5.0 Attitudes toward injury	
	+	−	+	−	+	−	+	−	+	−
1	16	5	7	6	9	0	7	0	3	2
2	8	12	9	4	4	4	2	4	7	2
3	4	0	17	0	0	0	10	0	12	0
4	11	1	10	1	7	0	7	1	11	0
5	15	4	3	8	4	6	2	6	1	4
6	9	9	3	7	2	5	3	4	6	2
7	15	1	16	0	6	0	2	6	1	4
8	20	0	6	3	5	0	6	2	7	0
9	16	3	6	4	1	3	4	4	5	1
10	11	4	8	0	12	0	9	0	11	0
11	1	9	1	12	3	0	2	6	2	4
12	17	1	12	2	4	0	11	0	9	0
13	24	0	18	0	10	0	8	0	8	0
14	10	5	14	2	12	0	8	0	9	0
15	9	0	10	2	10	0	5	0	7	1
16	11	1	14	2	12	0	9	0	12	0
17	4	0	7	4	1	0	2	1	6	0
18	17	4	10	2	6	6	7	0	6	0
19	15	4	10	1	4	1	10	0	11	0
20	17	3	12	3	4	5	8	0	12	0
21	20	2	11	6	9	0	12	0	10	0
22	3	1	0	14	6	2	3	2	2	7
23	22	4	17	0	12	0	12	0	12	0
24	7	8	6	2	4	2	6	3	9	0
25	12	5	10	2	12	0	6	1	12	0
26	11	3	9	1	1	2	1	1	1	2
27	15	4	5	8	2	3	3	5	3	0
28	14	4	3	5	9	0	4	1	4	2
29	10	3	5	6	12	0	5	0	5	2
30	13	4	9	2	4	6	4	2	7	0
31	6	0	18	0	11	0	10	0	9	0
32	15	4	16	0	11	0	7	0	11	0
33	15	6	9	2	5	1	6	4	12	0
34	9	8	1	12	10	0	2	5	2	8
35	2	13	5	7	5	4	4	4	9	1
36	16	1	14	1	12	1	10	0	11	0
37	4	10	4	7	1	3	1	3	4	2
38	5	3	15	0	11	0	5	1	11	0
39	12	3	10	2	12	0	11	0	8	0
40	7	7	3	6	6	6	3	5	8	2
41	2	0	14	0	9	0	8	0	8	0
42	19	4	15	0	12	0	12	0	11	0
43	5	3	1	6	3	1	7	0	6	0
44	15	2	13	0	11	0	6	1	10	0
45	25	2	9	1	5	0	11	0	9	0
46	9	1	1	4	8	0	4	2	2	2
47	19	0	10	0	6	1	4	3	5	3
48	18	0	10	3	0	1	6	1	1	0

The wide range of digits suggests the extent to which each of the major categories of evaluation found support in interview data. It is not without significance that the rating blank tended to separate the subjects so clearly from each other in terms of the categories evaluated.

Although our experience with this procedure is limited, we can recommend it to others. As in all clinical techniques, however, success with it is more dependent upon the clinical skill of the psychologist who serves as evaluator than it is upon the rating blank itself.

Summary

1. Forty-eight male above-the-knee amputees, all veterans of World War II, were evaluated by means of an assessment battery which contained a Guided Clinical Interview.

2. A description of the kinds of interviews conducted is offered, and it was noted that these averaged about one hour in length, were more directive than nondirective, and were recorded.

3. The method for using a Guided Clinical Interview Blank which was developed is outlined, and the limitations are pointed out.

4. Data resulting from the analysis of forty-eight Guided Clinical Interviews are reported.

5. The method is recommended for further use and study.

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AN ATTEMPT TO VALIDATE THE EFFECTIVENESS OF THE CONTROL ROOM FOR CHILD TRAINING*

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Introduction

In a recent article[1] certain procedures were advanced for the effective organization of child behavior in the home. Essentially, the rationale of these procedures was predicated upon the following observations:

1. Current methods of "reasoning" with a child are not effective agents for successful child training.
2. In order to assist the youngster to develop healthy ego attitudes in the process of differentiation, it is of the utmost importance that such learnings be developed out of a matrix of impersonal and non-affective reality experiences.
3. The utilization of a control room accomplishes the goals of directed canalizations based upon the child's interests to further his own ends by conforming to the requirements set before him.
4. The use of a control room eliminates all of the unhealthy emotional influences which arise from parental over-verbalizations.
5. Above all, the control room procedure causes the child to experience a certain minimal amount of frustration as an intermediate step toward the development of self-control.

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Procedure

In an effort to validate the effectiveness of the control room methods, the following subjects and materials were employed in the present investigation:

1. Parental and nursery school rating scales were devised. Essentially, these scales instructed the raters (a) to avoid their own personal biases when rating the youngsters, (b) to rate the child both before and after the use of the control room,[1] and (c) to enter their ratings upon a 5-point scale for

[1] This specific instruction refers only to the parental rating scale. The nursery school ratings were made upon the control room (C. R.) children. Here the evaluation was concerned with the emotional adjustment levels of the C. R. child at the time of school admission and after a substantial attendance in the school.

TABLE 1. *Showing the sex, age and other characteristics of 13 children rated by parents before and after regular use of the Control Room.*

Child	*Sex*	*Age (when rated)*	*Age C. R. initiated**	*Rating E. A. before use of C. R. (with scale values)†*	*Regular use of C. R.‡*	*Rating E. A. after reg. use of C. R. Final scale values*	*Indispensability of P. C.§*
A	M	7 yrs.	3 yrs.	Very poor 1	7 mos.	Above average 4	Yes
B	M	7	5	Below average 2	4	Above average 4	Yes
C	F	7	5	Average 3	4	Above average 4	Yes
D	F	6	3	Very poor 1	12	Average 3	Yes
E	M	5	2	Average 3	7	Above average 4	Yes
F	M	3-3 mos.	2-9 mos.	Average 3	6	Above average 4	Yes
G	M	3-7 mos.	3	Average 3	3	Above average 4	Yes
H	M	13-9	8	Average 3	3	Above average 4	Yes
I	F	10	5	Average 3	3	Above average 4	Yes
J	M	9	8	Very poor 1	11 mos.	Average 3	Yes
K	M	10	9	Below average 2	7 mos.	Average 3	Yes
L	M	14	12	Average 3	4 mos.	Above average 4	Yes
M	M	3-3	1-10 mos.	Average 3	12 mos.	Above average 4	Yes
N = 13	10 M 3 F	M = 7.54 yrs.	M = 7 yrs. 10 mos. Median = 5 yrs.	M = 2.38 M = 2.17 for a final	M = 6.4 mos. Median = 3 mos.	M = 3.77	Unanimous

* C. R. refers to control room. † E. A. refers to the emotional adjustment level.

‡ Regular use of C. R. (has reference to the consistent use of the control room until adequate organization of behavior is considered to have been accomplished. It does not mean complete discontinuance of control room).

§ Has reference to psychological course provided parents. Question on rating scale is as follows: Do you feel that the preliminary course of psychological analysis which you received was indispensable to the carrying out of adequate child training in the home? Yes ☐ No ☐.

TABLE 2. *Showing emotional adjustment ratings* received from three nursery schools on six children who received Control Room Training.*

Child	*Sex*	*Age rated*	*Age entered school*	*Age C. R. initiated*	*Term in school*	*Initial rating scale value*	*Status during school term*	*Final rating scale value*	*Regular use of C. R.*
A	M	7	4 yrs. 4 mos.	3 yrs.	2 yrs.	3	Improved	Extremely well adjusted 5	7 mos.
B	M	7	3-6	5 yrs.	3 yrs.	3	Improved	Above average 4	4 mos.
C	F	7	5-9	5 yrs.	2 yrs.	3	Improved	Above average. 4	4 mos.
D	F	6	3	3 yrs.	3 yrs.	2	Improved	Average 3	12 mos.
E	M	5	2	2 yrs.	2½	3	Improved	Above average 4	7 mos.
F	M	3.2	3	2-9 mos.	6 wks.	4	Same	Above average 4	6 mos.
N = 6	4 M 2 F	M = 5.86	M = 3.6	M = 3.5	M = 2.1	M = 3 (M = 2.16 parental scale)	5 of 6 Improved	M = 4	M = 6.3 mos.

* Scale values for levels of E. A. (Emotional Adjustment) are as follows: 1. Extremely poor E. A. 2. Below average E. A. 3. Average. 4. Above average. 5. Extremely well adjusted.

levels of emotional adjustment.[2] All of the parents of the 13 cases in this study were asked to evaluate the importance of the preliminary course of psychological analysis and training which they received prior to the application of the control room procedures.

2. Only 6 of the 13 children had received the benefits of nursery school experience. Of the remaining 7 cases, four were given the California Test of Personality as a further measure of validation (the test was not applicable to the three youger children).

The necessary data relating to the variables of age, sex, time-relations, etc., are presented in Tables 1 and 2.

Results

Parental Rating Scale. Examination of the data in Table 1 shows the following:

1. The mean age of the subjects with whom this study is concerned is 7.54 (at the time they were rated or tested).
2. Although the mean age of 7 years and 3 months represents the average age when the control room was first used for the organization of the child's behavior, the selection of the median of 5 would be a more valid indicator. This follows in the light of the fact that since the size of N is very small, the several extreme age scores of H, J, K and L would have a disproportionate weight in placing the mean.
3. It is of interest that the mean (parental) rating of 2.16 relating to the emotional adjustment level of the six subjects before being conditioned by the control room, falls short of the mean scale value of 3.0 applied to the same subjects by the nursery school rating scale. Further evaluations of this discrepancy will be made in a later section.
4. The results indicate that the control room was used regularly for a group average of 6.4 months.
5. The parental rating of 3.77 for E. A. after regular use of the control room as against the scale value of 2.16 before the application of the control room shows that the parents regard the use of the C. R. as a very successful procedure for effecting organization of behavior.

[2] The variable of emotional adjustment (E. A.) was defined in the parental rating scale as comprising: (1) extent of obedience, (2) feelings of security, (3) freedom from nervous symptoms, (4) ability to get along with people, and (5) freedom from emotional disturbances. In the nursery school rating scale, E. A. was defined as follows: (1) The ease with which the child made his adjustment into the nursery school group, (2) his freedom from anti-social tendencies, (3) degree of independence (self-reliance), (4) ability to respond to routine, (5) emotional adequacy, and (6) sociability. The variation in the two scales with respect to E. A. is due to the variation in social surroundings and group relations.

6. The parents are uniform in the belief that a preparatory course involving psychological analysis of their own personalities and specific guidance in the administration of C. R. procedures, are indispensable agents in promoting effective organizational methods.
7. Although the variable of sex was not controlled, the results do not appear to show any significant sex differences as far as response to C. R. techniques is concerned.

Nursery School Rating Scale. Evaluation of this scale discloses the following facts (see Table 2):

1. Three of the six children rated had already been graduated from the nursery school at the time the ratings were made. Their mean age at time of rating was 5 years and 9 months.
2. The average time spent in nursery school was 2 years and 1 month.
3. The average age of the child upon nursery school entrance was 3½ years. This compares with a mean age of 3 years and 5 months when the C. R. was first used by the subjects.

   In view of the marked overlap which characterizes the cases with respect to C. R. training in relation to school entrance, it becomes difficult to draw any reliable conclusions. It would seem that valid estimates could be made only in regard to cases A and C which had received completed C. R. training before school admission. Evaluation here shows that these two cases were rated "average" at the time of school entrance.

   In only one instance was a rating of 4 given to a school entrant (Child F) who had the benefit of 3 months C. R. training at the time he entered school and 3 months of C. R. training after admission.
4. Subsequent observations by the nursery school raters provide more definite indications of the C. R. advantages. It will be observed that all of the six C. R. youngsters presented favorable conduct during their school terms. Subjects A, B, and C who were originally rated a scale value of 3 obtained the respective scale values of 5, 4, and 4. Subjects D, E, and F whose initial values were respectively 2, 3, and 4, secured final ratings of 3, 4, and 4.

   Since 5 of the 6 C. R. pupils obtained ratings of above average for emotional adjustment in comparison to the remainder of the school population and since the 6th C. R. child maintained his above average score throughout his school term, the evidence suggests the conclusion that the C. R. techniques lead to a healthy organization of the child's ego. It will be observed from Table 2 that virtually all of these children were undergoing C. R. training during their school terms.
5. The initial scale ratings made by the nursery schools are more favorable to the children than the initial scores provided by the parents (nursery school mean: 3.0; parental scale mean: 2.16).

California Test of Personality. Results of the test as administered to four children who had not been in nursery school indicate a mean percentile score of 93 for the category of total (emotional) adjustment. Further comparisons yield the following observations:

1. The mean age of the 4 subjects at the time of examination by the California Test was 9 years and 1 month. The mean age at which the C. R. was initiated for this group was 6.28. Average C. R. conditioning lasted only 5 months.
2. The parental (initial) ratings of these 4 children show a mean scale value of 2.5 as against the parents' final mean scale value of 3.75. Taken individually, subjects G, H, and I each advanced from an initial rating of 3 to a final one of 4. Subject J whose initial scale value was 1 obtained a final parental rating of 3. The mean rating of 3.75 for this group of 4 subjects compares favorably with the mean scale value of 3.75 for the entire group of the 13 C. R. children rated by their parents.
3. The percentile scores of children G, H, I and J were 99, 95, 99 and 80, respectively. Since there are 3 variables in the California Test of Personality which are more or less common with those subsumed under E. A. in the rating scales, the following comparisons seem justified:

Categories: California test	*Mean percentile scores (Sub.: G, H, I, & J)*
(a) Self-reliance	91
(b) Freedom from nervous symptoms	91
(c) Freedom from anti-social tendencies	94

The results therefore show considerable correspondence between the parental ratings and the test scores in indicating above average emotional adjustment of 3 of the 4 subjects and a lower test score for the 4th child whose rating was only 1. Of added significance is the comparison which reveals that although the subjects were tested approximately three years after regular conditioning by the control room (M 9.10-M 6.28) their test scores reflect continued above-average emotional adjustment in the majority of the cases.

Summary and Conclusions

This study deals with a group of thirteen children whose behavior was conditioned by the method of a home-control room. In each instance the parents obtained psychological re-education preparatory to receiving training in the use of the control room procedures.

In order to test the validity of these procedures for the successful organization of child-behavior, several selective devices were employed: (1) parental rating scale, (2) nursery school rating scale, and (3) the California Personality Test which was applied only to those children who had not attended nursery school.

The findings suggest the following observations:

1. The results showed that the parental rating scale, the school raters and the test results were independently in marked agreement in designating the children who had been trained by the control room method as being above average in emotional adjustment.

2. In the case of the four subjects who had been tested approximately three years after discontinuance of the control room training, the results suggest the conclusion that the specific and uniform measures of organizing the ego through the use of the control room lead to lasting results.

3. Of particular value is the finding that the parents of the 13 cases did not find it necessary to use the control room regularly for more than an average period of 3 months (median) to establish basic and satisfactory organization of the child's behavior.

4. The results of this study should not be regarded as conclusive since (a) no advanced statistical treatment was undertaken due to the small size of the sample, and (b) the expertness of the raters is open to question. In regard to the latter limitation, it should be noted that although one would expect to find satisfactory educational and personality qualifications in the school raters, no information had been secured in regard to these variables; hence, validity in this instance has not been established.

In respect to the qualifications of the parents as raters, some definite evidence can be considered: (a) by virtue of extended psychological conferences with the parents, they directly and indirectly received training in the matter of objective

evaluation of the personal behavior of their children. It would therefore seem reasonable to assume that these parents were better qualified than the average parent to act as objective raters of their own youngsters. In addition, it will be recalled, the instructions on both the parents' and nursery school rating sheets cautioned them not to permit their own biases to enter into the evaluations of the behavior of the subjects. On the other hand, the well known weaknesses inherent in the use of rating scales must inevitably lead to cautious interpretation.

5. On the basis of the foregoing observations, it is evident that the results of this study should be very conservatively interpreted and considered merely as a preliminary and pragmatic attempt at validation procedures.

6. In view of the nature of this study, it should be realized that the size of N is directly limited to and contingent upon the number of cases whose parents have first undergone individualized psychotherapy.

7. It is suggested that future research could appreciably enlarge the scope of validating the control room procedures by (1) utilizing suitable test material for purposes of evaluating the emotional adjustment levels of the parents both before and after psychological re-education, and (2) applying available personality measures upon the children both before and after regular use of the control room. The Rorschach could very advantageously be used in both of these instances. Of added significance would be a more extended follow-up study which would measure the extent of personality gains over a period of several years by the C. R. subjects.

8. The results of this study appear to be in a positive direction and suggest the conclusion that with an increased N and with the application of more extended validational methods as previously suggested, there is reason to believe that greater validity would be established in proving the control room to be a most effective procedure for the healthy organization of the child's behavior.

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THE PSYCHOLOGY OF CONTROL

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INTRODUCTION

Due to the influence of objective psychology which limited the subject matter of scientific psychology to phenomena which could be objectively demonstrated and measured, phenomena related to self-control or volition have generally been neglected or denied in American psychology. The unfortunate effect of the rejection of these concepts was the denial of the reality of the phenomena with which they attempted to deal. Thus in clinical psychology and psychiatry, standard methods of diagnosis and therapy give little attention to problems of control because of the assumption that behavior is caused by some form of psychic determinism represented by instincts,

childhood conditionings, constitutional factors, unconscious complexes or other processes over which a person can exert little conscious control. It became therapeutically unfashionable to attempt to train the patient in methods of self-control since it was assumed that depth factors in personality could only be influenced by psychoanalysis or some other depth therapy.

The purpose of this paper is to stress the importance of a reexamination of the whole problem of self-control or volition in order to facilitate a trend back to the more central position of recognizing the existence of personality factors contributing to self-control, and of developing techniques for diagnosing and treating disorders of control. Richards[9] recognizes the importance of the problem when he devotes large sections of his recent text on modern clinical psychology to the nature of control and methods for its appraisals. His discussions constitute one of the most eclectic and valuable treatments of the problem. De Forest[2] discusses the significance of the self-control developed during psychoanalysis emphasizing that without knowledge of Self, intelligent control is impossible. Self-knowledge results in the productive freeing of intelligence by making possible finer discriminations and choices between alternative actions. This "channeling" of self-expressive impulses involves a basic distinction between the existence of affective life and the patterns of its expressions. Control does not involve a rigorous repression or inhibition of feelings, but rather an intelligent choice of which emotions to express and how to do it.

Definitions. The existence of specific processes in personality designated by the terms *self-control, conation, volition* or *Will-Power* is difficult to demonstrate directly but may be inferred from objective and subjective observations of behavior in which a person shows some ability to (a) repress or modify affective expressions, (b) discriminate cues more exactly, (c) learn adequate verbal (symbolic) representation of problems, and (d) initiate action by appropriate self-signaling devices. One of the most patent facts of introspection is that the normal person is consciously aware of an ability to think over problem situations, recognizing and weighing alternative plans for action, and then choosing whichever plan best suits the needs of the moment. The psychophysical determinants of conscious volition are not currently completely known, however experiments such as that of Hudgins[7] suggest that the psychology of learning will eventually demonstrate the mechanisms involved.

Self-control involves the conscious ability to initiate, sustain, suppress, repress or terminate behavior, particularly the conscious control of affective expression. Although the possession and intensity of feelings, emotions, impulses and attitudes may be determined involuntarily (unconsciously) and are therefore beyond control since they exist as facts, it is also a fact that definite methods are available for diagnosing disorders of control and instituting appropriate training procedures. The factors determining self-control are not instinctive, intuitive, supernatural or mysterious, but are the result of a definite learning process involving a large number of specific patterns which any particular person may or may not master. Although limited by innate capacity, the acquisition of control appears to be specific to certain learning situations and cannot be expected to exist in the absence of adequate training. In his concepts of *discriminative capacity, drive arousal* and *discharge control,* Freeman[5] outlines the factors involved in the learned ability to selectively utilize the innate functions of excitation and inhibition which exist in the intact organism.

Nature of Control. While such concepts as mind, self-control, volition or Will-Power are admittedly mentalistic and therefore controversial in relation to psychological science, the phenomena may be investigated by operational methods which do not pretend to elucidate absolute properties but are concerned with the reporting of observations, procedures and steps which intervene between the initial and final acts of a behavior pattern. The nature of controls may be objectified by operational studies of the

conditions and situations in which control is learned and exercised. For operational purposes, it does not matter whether the type of control to be learned involves the acquisition of hand-eye coordination in an infant or of skill by the violin virtuoso. Qualitatively, the steps involved in acquiring self-control appear to be similar although large quantitative differences are observed in degrees of skill acquired. The acquisition of control may occur in a few minutes, as in learning to synchronize clutching and shifting operations in driving an automobile, or may require many years of intensive practice as in learning to be a tennis star or a fine craftsman of any type.

Because of the relatively short life span and the almost infinite number of controls to be learned, it is inevitable that any person may acquire only a limited number of patterns of control. Due to the infinite richness of human living, almost any permutation or combination of types and degrees of control are possible. It will require intensive research of the magnitude currently engaged in the study of the nature of intelligence to elucidate the nature and variety of types of control. Suffice it to state that the appraisal of control in personality study is equally important to the appraisal of capacity and motivation, and deserves more attention than it has thus far received.

Emotional Controls. The problem of learning to control affectivity presents technical difficulties of similar complexity to the learning of any complicated act such as playing the piano. One cannot learn any complicated task without long hours of intensive training and practice beginning with elementary tasks and gradually learning more difficult ones. It is no more possible for a person to exert emotional control without preliminary training than to expect him to go out and play tennis after being told to do so. The accomplishment of any complex type of control cannot be acquired directly from observation or reading but must be learned organically by doing with repeated practice until the required coordinations become perfected and habitual. Ideally, as with any other type of complicated training, exercise of emotional control should be taught in early childhood so that the person gradually and progressively acquires the ability before acute need for application arises. Unfortunately, this training has not been acquired by many neurotics and immature personalities before they become involved in maladjustments and one of the objectives of therapy thus becomes to accomplish this training which should have been begun many years before. It is obvious that the longer such training is postponed, the greater are the technical difficulties in accomplishing it under conditions of acute maladjustment.

From this viewpoint, then, a major objective of psychotherapy is the beginning of a course of training in emotional control so that the person (a) learns to perceive affective components in his personality, (b) learns to understand their role in the psychic economy, (c) learns to discriminate between those which can and cannot be modified, (d) learns to accept and live with those which are unmodifiable, and (e) learns to express affectivity selectively and appropriately by the use of mechanisms to be outlined later. This therapeutic objective may involve tasks of varying degrees of complexity, but the hopeful fact is that every person possesses some degree of potentiality for learning to control affective-impulsive behavior.

Clinical Applications. As emphasized by De Forest[2], disorders of control are a common denominator in almost all mental disorders in which each symptom shows the constant element of a person unable to control some factor in himself, of being at odds with himself. Intellectually, the person may want to control himself and may know what he should do, but he is unable to control affective-impulsive behavior. Exhortations to the person to use Will-Power in developing self-control are notoriously unsuccessful because if the person could have done so he would have done so. It is admitted that in the more global personality disorders such as the psychoses, the person has little ability to control involuntary manifestations of the disease. But in the neuroses, attitudinal pathoses and minor maladjust-

ments, the person may have sufficiently intact resources to learn control and it is here that it is important to diagnose disorders of control and to give suitable training. The basis of all depth therapy is to uncover the unconscious complexes and emotional blocks which are etiologic to maladjustment, so that by acquiring insight and increased self-knowledge the basis is laid for more effective control. But as Rank[8] and others have indicated, insight into the etiologic causes of maladjustment is frequently insufficient to result in adjustment unless this heightened self-understanding can be translated into effective action. The person comes to understand how he got that way, but still does not know what to do about it. Insight and self-knowledge may facilitate the learning of control but they are not identical with control.

Modern psychiatric theory postulates that immature or conflictual emotional attitudes are the etiologic factors in functional mental disorder. From the viewpoint of this paper, these conflicts exist as facts and the significant thing is not their existence as natural phenomena but what the person *learns* to do about them. It is conceived that control of affective expression is one of the most difficult tasks confronting any person, particularly if he is constitutionally predisposed to intense affective reactions. Richards[9] has listed inadequate forms of control under the designations of (a) over-control or repression, (b) under-control or overexpressiveness, (c) tentative control or anxiety, and (d) distortions of control resulting from attempts to resolve the conflict between the Pleasure-Pain and Reality principles. Disorders of control may represent either failure to learn controls, faulty or inadequate learning, or as involving constitutional or learned reactions to stress. From our viewpoint, disorders of control are to be regarded as learning problems.

Diagnosis of Disorders of Control

General. Assuming that patterns of control are learned specifically with little transfer of training except in general methods, any comprehensive diagnostic evaluation must include the entire range of performance from simple habitual routines to studies of how the person controls himself under the most acute conditions of stress. This information may be obtained from any of the standard techniques of personality appraisal in which the emphasis is placed on evaluating control. Richards[9] has given the most comprehensive discussion of the utilization of direct and indirect methods in the appraisal of control. Although not primarily designed to measure control, prolonged direct observations, case history methods, intelligence tests, projective tests, attitude tests, aptitude tests, personality inventories and many other methods may be utilized. Richards uses this data to answer the questions: Is the person functioning at fullest capacity? If the person is to some degree incapacitated, what are the personality dynamics involved? Major emphasis is placed on emotional factors which are accepted to be of major etiologic importance.

It is probably invalid to attempt to evaluate control on the basis of test results alone since few tests sample a large enough area of concrete behavior situations. In actual practice, the case history usually gives clear indication of the behavior areas in which control is lacking. It is theoretically possible to quantitatively arrive at a measure of over-all control, possibly called the Control Quotient (CQ), which would relate a person's control at each chronological age with standard norms at each age level. This is a research project of the future. A variety of standard experimental methods are available for measuring both the amount of control and its fluctuations in specific situations. Many of the classic experiments, such as reaction time and other motor coordination tests, need to be reevaluated as measures of control. Among test instruments, the Doll Social Maturity Scale is an example of a device which systematically samples examples of control in young children.

Outline for Evaluating Control. Since 1939 we have attempted to make appraisal of control a formal part of every personality evaluation[1]. Some evidence may be obtained from observation in test situations and personal interviews, but in

our experience it is desirable to obtain a representative sample of estimates of control in certain standard life situations in which disorders of control are known to be common. World War II experience in the examination of army selectees indicates the importance of collecting objective evidence concerning actual behavior in areas wherein control is a critical factor. It seemed possible to construct a simple outline for questioning (both direct and indirect) which would elicit reliable data concerning control. Preliminary investigations indicated that important evidence could be obtained by sampling behavior in the areas of (a) habits and routines of living, (b) patterns of affective expression, (c) stability of work habits, (d) personal conduct with reference to law and order, (e) conduct in social situations, and (f) personal responsibility or dependability involving the ability to learn and do what is expected of one. Every individual has theoretically been exposed to extensive training routines intended to develop control in each of these areas, and it is easy to obtain direct and indirect evidence concerning extent of control shown.

The outline is divided into four parts for use with age groups in the ranges of 0-5 years, 6-11 years, 12-20 years, and adulthood. Ten areas of conduct were chosen in each age range which on the basis of clinical experience were believed to measure control. No validation experiments have been attempted with the preliminary scales which are offered only as a research approach. However, it will be noted that the scales include items included in standard outlines for interviewing and on personality inventories. A numerical score might be assigned on the basis of total number of items successfully passed, but this value would theoretically indicate only roughly how successfully the person had learned specific patterns of control.

An Outline for the Appraisal of Control

I. Early childhood (0-5 years).
  1. Neuromuscular coordination.
    A. Age of sitting, walking, running, talking and other coordinations.
    B. Measures of the quality of the above patterns. Ability to sit quietly, etc.
  2. Control over natural functions.
    A. Age of bladder control (day and night) and bowel control.
    B. Eating habits. Does child eat steadily and uncoaxed? Use of table utensils? Eat everything? Eat rapidly or dawdle? Table manners unprompted?
    C. Sleeping habits. Go to bed without continual prompting? Sleep with light out? Keep coming down stairs, crying or demanding attention?
  3. Emotional expression.
    A. Crying. Does he use crying to get attention? Thresholds of crying (high or low)? Ability to withhold tears?
    B. Fear. List phobias.
    C. Anger and rage reactions. Threshold and frequency of temper tantrums?
  4. Habitual manipulations. List habitual manipulations such as thumb sucking, nose-picking, nail biting, pounding head, rocking, masturbation, etc. Age at which stopped each?
  5. Habits of play and work.
    A. Play. How well does child entertain self? Can he tolerate being left alone for long periods? Persistence at play activities?
    B. Work. Perseveration at simple tasks within ability? Ability to complete difficult tasks.
  6. Social behavior.
    A. Conduct in group situations. Control of excitability? Boisterousness?
    B. Socialization. Actions toward other children? Control of aggressiveness?
  7. Handling of property.
    A. Destructiveness. Age of controlling wanton destructiveness, *i.e.*, tearing off wallpaper, defacing walls, destroying toys, breaking furniture, etc.?
    B. Care of personal possessions. Brings toys in? Keeps toys neat?
  8. Reaction to authority.
    A. Obedience. Without prompting? Without rewards or threats?
    B. Reaction to direction. Accepts or rejects direction?
  9. Responsibility.
    A. Carefulness. Wanders away from home? Crosses street carefully?
    B. Time schedules. Has some idea of paying attention to time? Dresses self on time?
  10. Reactions to stress.
    A. Separation from parents. Able to have parents leave home at night? Adjustment to baby sitters, strangers, etc?

B. Self-reliance. Does remain stable under pressure, seeking a solution? Or tend to disintegrate emotionally?

II. Childhood (6-11 years).
1. Neuromuscular coordination.
A. Athletic ability. Able to climb, run, ride bicycle, play baseball, football, ski, etc.?
B. Use of hands. Able to do fine work, write, handle tools, paint, play piano, etc.?
2. Personal habits.
A. Personal cleanliness. Wash regularly? Take baths alone? Clean teeth? Care of personal apparel?
B. Eating and sleeping. Judgment in choosing foods? Gorge candy or other foods if given opportunity? Goes to bed on time? Gets up on time?
3. Emotional expression.
A. Further observations on phobias, tantrums and crying.
B. Reactions to frustration. Quarrelsomeness? Can stand teasing, kidding?
4. Habitual manipulations.
A. Masturbation. Learns not to be conspicuous? At night?
B. "Nervousness." Able to stand or sit still? Always handling or touching things?
5. Habits of play and work.
A. School routines. Able to complete exercises? Checks work?
B. Work at home. Chores completed alone? Plays or works at models with purpose and continuity?
6. Social behavior.
A. Courtesy and respect for rights of others.
B. Subordination to group welfare. Self-effacing? Modest?
7. Handling of money and property.
A. Use of money. Thrifty or spendthrift? Judgment in spending?
B. Conservation of property. At home? School? In community?
8. Conduct.
A. Truthfulness.
B. Honesty. Steals? Cheats?
9. Responsibility.
A. Keeps word. Trusted to follow time schedules?
B. Obedience. When unwatched? Reactions to authority and direction?
10. Reactions to stress.
A. Self-control in meeting new situations. Before groups? Competitive athletics? Away from home?
B. Resistance to pain. Cries when injured?

III. Youth (12-20 years).
1. Neuromuscular coordination.
A. Gross coordinations. Skating, dancing, athletic ability, tennis, diving, etc.?
B. Fine coordinations. Typing, mechanical ability, etc.?
2. Personal habits.
A. Attention to dress, posture and other expressive behavior. Neat? Hair and nails? Personal hygiene?
B. Eating and sleeping habits. Selection of meals outside home? Well-balanced diet? Likes everything? Use of tobacco? Time of retiring? Regular sleeping habits?
3. Emotional expression.
A. Sex behavior. Masturbation? Homosexual attitudes: freedom of expression? Heterosexual adjustment? Moderate or excessive?
B. Reactions to frustration. Good sport when losing? Controls self when provoked? Stress situations?
4. Work and recreation.
A. Work habits in school? At home? Outside home? Earns money for self?
B. Recreation. Skillful at variety of sports and games? What kind of competitor?
5. Intellectual control over affective life.
A. Control over impulsive behavior. Ability to sit still and wait for something to happen? Ability to withstand impulses?
B. Concentration. Ability to plan and execute actions to completion?
6. Social behavior.
A. Further training in socialization. Tactful? Altruistic? Group member? Participation in group activities? Smooth or difficult?
B. Dominance-submission ratios. Socially at ease? Able to hold own? Leader or follower?
7. Money and property.
A. Financial ability. Able to manage own affairs? Judgment in spending? Saves?
B. Personal property. Leaves things better than found them? Keeps things neat and clean? Keeps things in repair?
8. Conduct.
A. Reaction to law and authority. Bad companions? Frequent troubles with law or authority? Behavior in school, community and home?
B. Dependability without supervision. Easy to influence in wrong directions? Honest under temptation? Assumes responsibility for errors?
9. Health.
A. Reactions to disease or pain. Gives up easily? Stoic to pain?
B. Cares for self. Dresses properly to avoid exposure? Treats self or seeks care intelligently?
10. Responsibility.
A. Self-regulation. Effective? Carries out what knows should do?

B. Effective self-stimulation. Initiative in solving problems on own?

IV. Adult scale (21 years and over).
1. Personal habits.
A. Regularity of routines. Life well ordered? Balanced routines of living?
B. Utilization of time. Generally well occupied? Able to use leisure time efficiently? Entertains self with own resources?
2. Work habits.
A. General efficiency in work. Rating as worker? Quality? Quantity?
B. Specific work skills.
C. Work history. Changes of jobs? Satisfied? Fits in well? Promotions?
3. Affective behavior.
A. Stability and excitability. General control? Appropriate expression? Emotionality interferes with adjustment?
B. Frustration or stress. Able to control anxiety? Phobias? Chronic fear or anger states?
4. Sexual behavior.
A. Marital life. Adjustment? Moderate? Passion or genuine love?
B. Extramarital. Promiscuous? History venereal disease?
5. Interpersonal relations.
A. Family life. Likes children? Can handle them? Able to control aggressiveness or rejecting attitudes?
B. Other people. Human contacts easy and pleasant?
6. Money and property.
A. Financial. Budget? Sticks to it? Solvent? Investments?
B. Property. Keeps things up? Constantly improving things?
7. Civil record.
A. Asocial behavior. How many times arrested? Lawful and orderly?
B. Indulgence. Alcohol? Drugs? Tobacco? Social nuisance?
8. Health.
A. Reactions to disability or disease. Hypochondriasis? Per cent of time well?
B. Reactions to aging. Accepts aging? Adapts intelligently? Compensates?
9. Responsibility. (See previous levels)
10. Tolerance to stress and frustration. (See previous levels)

The items of this outline are recognized to involve a complexity of factors, but for present purposes they are to be interpreted as possible indices of control. It is assumed that the presence or absence of adequate training is the factor which determines whether any specific pattern of control is present. The items given above are intended only as a basic outline which may be supplemented according to the requirements of each case.

Analysis of Failure to Control. After the specific areas have been identified in which disorders of control exist, the second part of the diagnostic process involves the analysis of exactly what the person is failing to do or is doing wrong. The intensive diagnosis of areas of maladjustment will involve methods of trouble analysis such as are used in efficiency engineering. It may be necessary for the examiner to follow the person around with a note book in hand in order to observe the client's actions in detail. The rationale for this procedure is based on the premise that control is acquired as the result of learning process which may be analysed by known psychological methods. Expert psychological observation will usually reveal exactly what the person is doing wrong or failing to do, so that after an adequate job analysis it is possible to delineate the steps which must be efficiently accomplished.

Techniques for Training in Control

General. From our viewpoint, the acquisition of skills of all kinds may be regarded as involving problems of self-control whether the individual skill be learning to play tennis or learning to control emotionality. Training procedures in some skills are much more highly developed than in others since it is only with the evolution of civilization that many skills have been acquired and been considered proper subjects for training procedures. In the psychological field, noteworthy attention has been directed to the development of improved methods of sensory training, perceptual training, memory training, learning, muscular training including muscular relaxation, and many specific types of job training. On the highest levels of thought, the method of Yoga is an example of the intellectual controls which can be acquired. To date, there has been no systematic attempt in scientific psychology to explore the relationships of specific control skills to the problem of adjustment.

Are there personality disorders in which the principal etiologic factor is the failure to acquire requisite skills in various types of control? If so, can these phenomena be experimentally analyzed with the clinical objective of discovering rational methods of training and retraining?

If the basic assumption is accepted that self-control is a function of certain types of learning skills, then it follows that even the most difficult problem of training for emotional control depends upon the same basic laws of learning as apply to the acquisition of all other skills. Simply stated, one attains control only by repeatedly practicing it in an organic learning process, starting first with small matters and progressively perfecting the ability with problems of increasing magnitude. In our opinion, psychotherapy (like all learning situations) must involve two phases: (1) arranging the proper conditions conducive to learning, and (2) the actual training procedures involved in learning itself. Under arranging the proper conditions conducive to learning there may be subsumed such problems as removing emotional blocks to learning, securing suitable motivation to learn, removing ideological blocks, etc.

Intensive training in any skill is a laborious process which requires the most meticulous attention to many small details until performance approximates perfection. Until the client can be motivated to *work* at this most difficult task, training efforts will not be successful. The long hours of practice involved in perfecting any skill are filled with unspectacular monotony from which there is no short cut and which are not easy under the best of conditions. The problem is much more complicated with the neurotic person whose basic habits and attitudes are immature or unhealthy, and where training is started under the disadvantage of being forced to unlearn maladaptive reactions before new ones can be substituted. In maladjustments characterized by disorders of control, the therapeutic objective will be to train or retrain the client in order to develop skills which should have been learned early in life.

From the viewpoint of the psychology of learning, all methods of habit training appear to involve a standard pattern involving four principal processes:

1. *Analysis of the task or problem* with the objective of determining the necessary steps and how to accomplish them most efficiently. As Havelock Ellis once said: The important thing is to determine what the problem is. After that, solutions usually become apparent.
2. *Stimulate positive attitudes* in the learner by suitable motivational devices such as incentives. Structure the learning situation so that the learner knows what is expected and how to go about it.
3. *Provide practice situations* so that the learner can organically improve the skill by doing.
4. *Evaluate progress* not only to provide incentive, but also to prevent relapses or remissions or regressions.

Training proceeds most economically when the learner wishes to improve himself and accepts the restrictions imposed by the learning situation.

Elementary Steps. Training in control may well begin with basic habits of living by establishing a regular routine which tends to stabilize habits and to minimize procrastination. Evaluation of the daily schedules will frequently reveal disorders of control in relation to many little routines of living. The person exhibiting over-control may be gradually trained in greater expressiveness, while the undercontrolled person learns to exert repressions. The level of habit formation at which training is begun will depend upon the degree of disorganization present. Severe psychoneurotics and psychotics may require retraining in the most elemental routines, while persons with greater integration and efficient daily routines may start their training with relatively more difficult problems. Elementary steps may involve such problems as arising or going to bed at a stated time, eating regularly, adhering to work schedules, decreasing number of cigarettes smoked, attending to small duties formerly neglected, etc.

More or less firm but friendly supervision and direction may be necessary in accomplishing these first steps in control. Severely upset persons may be too ill to accomplish even the simplest tasks at home alone, and this may constitute an indication for institutionalization until a

working routine is acquired. In less severe cases, it may be desirable for relatives or associates to exert a firm but gentle insistence upon conformance to routines until such time as the person is able to continue alone. Supervision of this type is normally encountered in many life situations such as in schools, at work, or in group activities where subtle pressure is exerted upon the nonconformist to go along with the group. As with any other procedure, the quality of results will depend upon the skill and tact with which such supervision is exerted. It will be noted that such active measures may be indicated even in passive methods of therapy such as psychoanalysis. Freud[4], Ferenczi[3], Herzberg[6] and other analytically oriented therapists have outlined similar indications for dealing with specific problems of control. Much time may be saved if the total situation is arranged so that palliative and supportive treatment on symptomatic levels deals effectively with practical problems which must be dealt with before more basic etiologic causes are attacked.

Dealing with Negative Attitudes. Accepting the basic principle that little progress can be expected until the person begins to develop positive attitudes toward himself, it is necessary to uncover negative attitudes which impose limitations upon action. Every emotionally unstable person is aware of defects of control and usually states that he knows he shouldn't do such things but somehow can't stop doing them. These negative attitudes induce powerful negative suggestion effects, and little progress may be expected as long as they persist. The client is usually correct in his protestations of being unable to control himself, but is incorrect in believing that he doesn't possess the capability of learning control. It is futile to argue with the person or to exhort him to do things which are obviously beyond his control of the moment. The proper procedure is to revert back to simpler tasks until something is discovered which the person can do, and then to begin training on increasingly more difficult problems as the ability to exert control is developed. An important step in this procedure involves the demonstration that there should be no such attitude as is involved in the word "can't." Suggestion techniques may be very effective in reversing such attitudes, but in themselves will effect no etiologic cure, unless reinforced by other training methods.

The prime objective is to demonstrate to the client through his own experiences in solving increasingly difficult problems that he possesses inner resources of which he had not formerly been aware. These inner resources have been designated as Growth Principles, homeostasis, etc., but for current purposes may be subsumed under the general fact that *every intelligent person possesses large potentialities for learning.* Once the client discovers that there are ways of learning to solve problems formerly considered unsurmountable, positive attitudes toward self begin to reassert themselves and the retraining process gains momentum. Even the most severe psychoneurotics possess large resources for retraining if sufficient patience and facilities are available to carry them over the long and intensive training period which is usually necessary to achieve training in control. Finally, it must be emphasized that a complete impasse will be reached if the therapist holds negative attitudes and in any manner communicates them to the client. No case should be regarded as hopeless either by therapist or client.

Principle of Repetition. Unending practice is necessary to acquire and maintain habits of control. All skilled acts require more or less conscious attention until they are mastered and become automatic or habitual. Even after control is acquired, it must be practised constantly to prevent deterioration of function which may occur very rapidly particularly under severe emotional stress. During all life periods, every person is daily confronted with a myriad of tasks which he is disinclined to do. Simple inertia is perhaps the most difficult to overcome; to get started at an unpleasant task is frequently the most difficult part. Once underway, momentum tends to accumulate and carry through the activity to com-

pletion. Very few children are trained to master inertia and to make a start on things which they are disinclined to do. Instead they become adept at utilizing every possible escape mechanism in order to avoid the unpleasant and follow roads of least resistance. A large, as yet undetermined incidence of people never succeed in training themselves to do what they should do when it should be done.

One secret of perfecting self-control is to learn to execute tasks which one is at first disinclined to do. Early in life the child should be taught to systematically perform tasks which are unpleasant or formidable. Such tasks will usually be of graded complexity and within the possibilities of accomplishment. It is only after years of practice in doing what one does not want to do but knows is right, that control is established. There is apparently no shortcut for this intensive training whether it occurs in childhood training or in psychotherapy. This may be explained to the client with emphasis on the fact that only through constant repetition is perfection acquired in any skilled act. The client must learn that it is only through hard work and persistent concentration that the desired results will be accomplished.

Verbalization. Shaffer[10] states that the neurotic lacks self-control because (a) he represses or resists verbal representation of his problems and is therefore lacking in the verbal cues upon which to base a discriminative response, and (b) these voluntary responses are not reinforced by "self-signalling" involving silent implicit speech, or some other symbolic postural or gestural stimuli. Shaffer believes that normal voluntary control is attained through a process of reinforcement of verbally-stimulated responses so that insight automatically accompanies the adequate verbalization of the person's problems and their interrelationships. Psychotherapy is a learning process in which behavior is controlled by self-stimulating verbal cues.

Clinical experience generally supports this conception of the role of verbalization in learning control of all types. This process moves most quickly when expert direction can be provided in terms of detailed verbal cues by coaches, skilled directors, teachers, physicians and others who are able to give verbal formulas for accomplishing each step of a complicated behavior sequence.

Clinically, it is of the utmost importance to objectively measure and evaluate the verbal cues and other discriminanda which make possible effective self-stimulation. The basic method is to secure an adequate sample of the person's self-stimulating cues or verbalizations in order to evaluate their efficiency. This may be accomplished by obtaining a detailed description of just how the person proceeds to solve a problem with particular attention to the verbatim recording of inner speech or other reportable thought process. Where the subject has not become aware of these inner signaling devices, or where he does not have verbal fluency in describing them, it may be desirable for the observer to outline the problem by structuring the task as follows:

> Most people talk to themselves in solving their problems. For example, I might ask myself what is the nature of the problem and how should I go about it to think out possible solutions. I might say what is the best way to do this? Or, what am I doing wrong? Then after having worked out a plan of action, I might repeat to myself just how to go about accomplishing each step. I might remind myself about different things as I went along. I would like to know how you go about solving problems. Just tell me in your own words what you think about when you are faced with a problem.

Much can be done in teaching a person how to achieve more efficient ways of verbalizing the nature of problems and in developing cues for self-stimulation.

A less comprehensive evaluation can usually be made from casual observation of a person in action, and by collecting evidences of attitudes and methods from casual expressive behavior.

The use of stress situations. Anthropological investigations of training methods in societies which place high value on the development of bravery or fortitude emphasize training of the young in facing stress situations. The American Indians required young boys to engage in warlike games of increasing ferocity until high degrees of control had been obtained. Reports of the training

methods of the Hitler youth movement have stressed techniques for choosing boys capable of leadership and then training them in situations of stress and adversity requiring the ability to withstand unpleasantness and pain, to control emotional expression under stress conditions, and to think rationally in emergency situations. In America, the tradition of sportsmanship in athletics emphasizes emotional control and the attainment of high degrees of skill by rigorous training under restrictive conditions. In all of these situations, the emphasis is on acquiring of control through an organic process of *learning by doing*. In contrast with the tradition of progressive education (and nondirective therapy) which stresses maximum permissiveness in self-expression, advocates of the concept of discipline have emphasized the importance of teaching the person *to do what he does not want to do*.

Implications for education. Intensive training for control need not be repressive even though it has too often been so in the past. Perhaps the difficulty has been that many parents and teachers have expected control to be acquired too rapidly; have failed to understand that to acquire relatively simple controls may require months or years of intensive training. From this viewpoint, perhaps the major objective of education is to provide a gigantic exercise or training period in which the acquisition of control is a goal not secondary even to that of acquiring information. Indeed, it is fortunate if the young person has achieved a reasonable degree of control at age 21, sufficient at least to protect him from gross inefficiency or asocial acts. Each teacher must expect to spend long and monotonous periods in simply exercising the child's developing powers of control which appear to be largely specific to each discrete type of learning situation. Education is in truth progressive when it is able to give intensive training in self-discipline without making the whole process so unpleasant as to destroy the child's innate desire to learn.

Discussion

High achievement in any field of human endeavor usually involves attaining mastery or self-control over behavior patterns of the most tremendous complexity. In some few fields, the necessary aptitudes or talents may be innate or constitutional but most commonly they are achieved only after prodigious training periods in which control is mastered by interminable practice in every detail of the act. To become a musical virtuoso, a champion athlete, a master at contract bridge, or a skilled chef may require an intensive period of training involving most of the person's waking hours for periods ranging up to 10 or 20 years before the highest perfection is achieved. One can hardly underestimate the amount of training which is necessary to produce high accomplishment in any human activity whether it be chess or scientific research.

Analysis of the case histories of persons who have reached stardom in their respective fields of endeavor reveals that such an high level of perfection is rarely achieved through the unaided efforts of the person himself. More usually, the undeveloped prodigy is taken in hand by a gifted teacher who laboriously directs a training process which rigorously drills the person until perfection of performance is attained. This long training period is frequently a difficult process for all concerned. The trainee frequently lacks perspective concerning where he is going and may lack the motivation to carry on by himself. The long periods of monotonous repetition of small details may be boring and unpleasant, so that the trainee will need to be held to the task. In the same manner as the young colt must be broken to the saddle, so must the young human be trained to submit to the difficult tasks necessary in training. In other words, the training of the young even under optimum conditions is a stormy process in which the child is required to submit to many years of rigorous training frequently against his natural inclinations to follow roads of least resistance in the pursuit of pleasure. In the same manner as high-temper steel is forged in the furnace from baser metals,

so is human character and fortitude shaped by the conquest of adversity. High accomplishment is rarely achieved except through the arduous acquisition of self-control and discipline in stressful situations.

In our opinion, some elements in the modern orthopsychiatric and progressive education movements have failed to recognize the role of suppressive or repressive training and therapy in the acquisition of self-control and discipline. Clinical experience suggests that growth principles and uninhibited self-expression cannot be consistently depended upon to produce mentally healthy people when left unsupplemented by regulation and direction. The world is full of potentially gifted persons who have never harnessed their potentialities, or whose potentialities were allowed to be dissipated through self-indulgence. It may be stated as a basic axiom that the immature personality is not always capable of intelligent self-regulation and planning for the future but is prone to indulge in excesses of behavior determined by the impulses of the moment. Indeed, there is usually a tenuous balance between positive and negative factors in growth so that it is desirable to provide wise, firm guidance during child training so as to make certain that positive factors are reinforced and negative factors depreciated. Whether or not the individual wishes to do so, it will be desirable to require him to conform to the most valid concepts at time and place concerning what it is best for him to do. In general, the person may be left unregulated or regimented as long as his natural homeostatic resources lead him in paths of moderation but external control and direction may be indicated if he becomes involved in excesses which threaten his integrity or welfare.

Life must be recognized as a hazardous experience, replete with adversities which the individual must be prepared to overcome. Unfortunately, mankind has not yet discovered any method of preparing youth to face adversity except by exposing youth to adversity in gradually increasing doses until it becomes able to take care of itself under any conditions. There is no substitute for the fortitude which comes only from having learned to be under fire, *i.e.*, to learn to function even under conditions of great stress. It is no accident that the youth who has learned to stand up under competitive athletics later demonstrates the ability to remain integrated in situations of great stress such as war. Children cannot be taught how to face the hazards of life by overprotecting them or attempting to shield them from adversity in any form. The overprotected child is tragically unprepared to face stresses which the average child learns to take in stride.

Summary and Conclusions

It is postulated that defects or disorders in *learning* control may be an etiologic factor in the types of personality disorder which are characterized by disintegration under frustration or stress. Such reactions may be understood as *reactions of immaturity* involving both maturational and learning factors. Anthropological studies indicate that cultural factors are very important in determining the types and amounts of training in control which are required of the young.

The nature of controls has been defined operationally and explained in terms of modern learning theory. Clinical applications of this theory of controls are outlined. Methods of diagnosing disorders of control are discussed with presentation of a tentative outline which may be utilized to evaluate levels of control qualitatively. Based on the hypothesis that control is acquired though intensive training, techniques are outlined for developing control particularly over affective-impulsive life. The implications of this theory for clinical psychology, psychiatry and education are discussed. It is concluded that the measurement of control is an important and essential part of all personality appraisals which should be included in every psychological examination.

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THE FREE DRAWING TEST AS A PREDICTOR OF NON-IMPROVEMENT IN PSYCHOTHERAPY*

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STATEMENT OF PROBLEM

The Free Drawing Test has justified itself as a valuable, if simple clinical tool. Goodenough[1] used the drawing of a man as a measure of intelligence; Machover[2] published observations on the drawing of the human figure as a projective technique. One of the latter's major points is that free drawings of persons to some extent reveal the subject's expectations and perceptions of significant persons in his environment, including himself.

In this investigation it was felt more specifically that a subject's drawing might indicate the extent of his ability to relate to other persons. Inasmuch as psychotherapy is a process occurring within the context of an interpersonal relationship, a degree of capacity to form such a relationship is a prerequisite. Incidentally, this latter points to the reason we have chosen to predict "non-improvement" rather than "improvement." Many factors other than the patient's personality, such as the skill of the therapist, the particular techniques of the therapy, socio-economic events, will affect the eventual outcome, but none of these will have a chance to come into effective play in the therapy unless and until a minimal relationship between the individuals involved has been established. Therefore this study is pointed at identifying, by means of performance on the Free Drawing Test, those patients who do not improve in therapy.

METHOD

All case records which conformed to the following criteria were selected from the closed file of the VA Mental Hygiene Clinic, Chicago: (a) The patient had psychological tests prior to therapy; (b) The patient had at least five therapy interviews; (c) The diagnosis was psychoneurosis.

The records amounted to eighty, and they consisted of the progress notes recorded by the therapist after each interview. One graduate student interning in clinical psychology rated these cases on a five-point scale from "worse" to "much improved," applying this scale to five areas of functioning: somatic, intrapsychic, social and familial, economic and vocational, and sexual. The 25 least and the 25 most improved cases according to this scale were then judged by an independent rater, a clinical psychologist with ten years experience, who had instructions to dichotomize the cases into groups of improved and unimproved ones.† Agreement was obtained in 92% of the

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cases, and the four upon which there was disagreement were discarded for purposes of this study. Of the remaining 46 cases, 15 "improved" and 19 "unimproved" records contained the Free Drawing Test.

It should be noted that this sample of subjects is limited, in that all were male veterans receiving compensation for service-connected psychoneurosis. Ages ranged from 20 to 43, with the mean age of the improved group 26.9 years, of the unimproved group 28.3 years, the difference not being statistically significant. Educational level was somewhat higher than in the general population, ranging from 8 to 16 years, with the mean of the improved group at 12.4 years, of the unimproved group at 12.5 years. The difference in educational level is obviously insignificant.

Sixteen different psychotherapists served in the 34 cases under consideration, the number of cases handled by each ranging from one to six. One of the cases was given non-directive therapy and the others handled by what might be termed "psychoanalytically-oriented eclectic" techniques.

As administered at this Clinic, the Free Drawing Test instructions are to draw a man, then a woman, and then anything the patient likes. The drawing of the man was the only one considered in this study. To rate these drawings, three psychologists were asked to sort out those which were primitively drawn. There was high agreement among the judges, agreement seeming to center around the face as the differentiating area. A more objective procedure was then resorted to, whereby the drawings were scored according to Goodenough's criteria for the head[1, pp. 90–110]. These are listed below in abbreviated form; the designations are those used by Goodenough:

1 Head present—there must be an outline of the head.
6a Neck present—any clear indication of neck as distinct from head.
6b Outline of neck continuous with that of head, trunk, or both.
7a Eyes present.
7b Nose present.
7c Mouth present.
7d Both nose and mouth shown in two dimensions; two lips shown.
7e Nostrils shown.
8a Hair shown.
8b Hair present on more than the circumference of head, better than a scribble. Nontransparent.
12a Proportion of head area not more than ⅓, nor less than 1/10 of trunk.
14b All lines firmly drawn with correct joining.
14c Head outline without obviously unintentional irregularities. More crude circle than ellipse.
14f Features symmetrical in all respects: eyes, nose, and mouth in two dimensions.
15a Ears present.
15b Ears present in correct position and proportion.
16a Eye detail: brow, lashes, or both shown.
16b Pupil shown.
16c Eye detail: proportion: horizontal greater than vertical (except on profile).
16d Eye detail: glance (in profile).
17a Both chin and forehead shown.
17b Projection of chin shown, chin differentiated from lower lip.

Results

The results of this study are summarized in Table 1. It is apparent from these data that 12 patients in the unimproved group drew the face and head at a primitive enough level as to receive less than 16 of the 22 possible score points, while only one patient in the improved group did so. Out of 19 unimproved patients, then, 12 (63.2%) could be detected on the basis of these criteria, while only one case (6.7%) who benefited from

Table 1. *Subjects' scores on drawing of the head*

Improved		*Unimproved*	
Subject	*Score*	*Subject*	*Score*
1	22	1	22
2	22	2	22
3	22	3	22
4	22	4	21
5	21	5	21
6	20	6	16
7	20	7	16
8	20	8	15
9	19	9	12
10	18	10	11
11	18	11	10
12	17	12	10
13	17	13	10
14	16	14	10
15	12	15	10
..	..	16	9
..	..	17	9
..	..	18	8
..	..	19	5

therapy would have been falsely predicted. A chi-square test corrected for continuity was significant at the 3% level. These results would be obtainable by chance in only one of 34 such samples. If we assign 11.5 as the critical score, we correctly predict 10 patients who failed to improve, and no patient who did improve. Using this score criterion, a corrected chi-square test is significant at the 1% level.

Discussion

The results of this study indicate that certain patients who will not benefit from psychotherapy may be differentiated by their drawings of the head of the human figure from other patients about whom no such prediction can be made.

It has been suggested that improvement in psychotherapy is partially a function of the intelligence of the patient. Since drawings of the human figure have been used to measure intelligence, the question arises whether the obtained results may not be explained by a lower intellectual level in those patients who received fewer than 16 score points. That such is not the case is indicated by the fact that the 12 patients of the unimproved group who were successfully predicted by this test averaged 11.9 years of education, as against the improved group's mean of 12.4 years, the difference yielding a "t" ratio of only .14. Inspection of the drawings also points away from such an interpretation, for we find that the three patients who put no features on the head drew the rest of the figure with a high degree of sophistication.

Our data support the alternative hypothesis that in adult subjects attention to the features correlates with more emotionally toned personality factors, and especially with those which affect relations with other people. Machover states, "The face may be regarded as the social feature of the drawing"[2, p. 40]. With regard to the subject who omits facial features she writes that he "is one who is evasive about the frictional character of his interpersonal relationships. . . . Superficiality, caution, and hostility may characterize the social contacts of such an individual"[2, p. 40]. Corroborative evidence that the face is significant for those factors which affect non-improvement in therapy comes from a study by one of the authors, who found that the response "mask," on the Rorschach Test is significantly predictive of non-improvement[3]. It would seem that here too we have an indication of evasion of interpersonal relationships.

The results obtained perhaps could be best explained by a formulation that at any particular time each individual is possessed of a degree of ability to relate to others. This would hold true for both patient and therapist. We are unable to make any statement about the level of ability of the therapist, but by including a large number of therapists, we have hoped that individual differences cancel out. In the instance of the patient, however, we are here suggesting that we have identified by their poor performance in drawing the head of the human figure those individuals whose degree of ability to relate to others is less than the minimum necessary to form and sustain relationships within which therapy could proceed.

Possibly the group of patients who performed relatively well in drawing but who nevertheless did not improve in therapy included those whose therapy was affected by other factors which came into play after establishment of the therapeutic relationship. We note that these patients averaged 12.7 total therapy interviews, whereas those who performed poorly in drawing and also did not improve in therapy averaged only 8.1 interviews. The difference is not statistically significant, but may indicate a trend for the former patients to sustain therapy longer than the latter. The small number of cases included in this study, the fact that it was done only at one clinic, the peculiar characteristics of the sample, all place severe limitations upon the general applicability of the results obtained. Repetition in other therapy centers and with other types of therapy is advisable.

Summary and Conclusions

1. A study of 15 improved and 19 unimproved patients who received psy-

chotherapy in a VA Mental Hygiene Clinic revealed that failure to improve could be predicted by certain aspects of the Free Drawing Test in 12 out of 19 cases. This method incorrectly predicted only one case of 15 which did improve. The results were significant at the 3% level. Use of a more rigid critical score gives results significant at the 1% level.

2. It is suggested that if Machover's hypothesis that the face is the social feature of the drawing be accepted, the poor performance in drawing the face is indicative of inability to form that interpersonal relationship between patient and therapist which is the necessary context of the therapeutic process.

3. Limitations of this study preclude more than a tentative acceptance of the results and a limited application to the general problem of predicting success in psychotherapy.

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AN INVESTIGATION OF THE RELIABILITY AND VALIDITY OF JUDGMENTS OF ADJUSTMENT INFERRED FROM DRAWINGS

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Introduction

In recent years, the increasing importance of the clinical psychologist as a diagnostician has resulted in increased pressure involving the need of varied techniques to be used in the description of personality. One effect has been that clinical psychologists have turned to methods not originally devised for the purpose for which they are being used clinically. One of these techniques, the Drawing-of-a-Man, originally adapted by Goodenough[2] as a measure of intelligence in children, has been rather widely adopted as a projective technique.

Much of the discussion of this technique has centered around the isolation and delimitation of various factors or qualities of the drawings which are purported to have diagnostic significance. Heaviness of line, continuity or lack of continuity, accentuation of various features, size, movement, omissions, clothing and other factors have been studied in an effort to show their relation to certain personality characteristics. In the interpretation of drawings as projections, the various specific factors are usually gathered together by someone expert in clinical synthesis. The type of clinical interpretation offered, for example, by Machover in her case study of a frontal lobe injury patient[5], brings together many specific elements from the drawings, perhaps emphasizing some elements and passing over others. The degree to which the interpretation is determined by the specific elements, rather than by intuitive overall impressions, is not clear. Presumably, interpretation depends on specific elements and their synthesis.

Without questioning the efficacy of the above approach, the authors have attempted to devise a test of the validity and reliability of global judgments of adjustment inferred from drawings. The global judgments considered may or may not involve a synthesis of specific elements. It is our observation that many, if not most, clinicians make judgments and interpretations of patients' drawings with little conscious attention to specific, molecular factors of constant significance,

but rather as a result of global impression, of unverbalized comparison of a present drawing with past experience, of "intuitive" or insightful impressions. The present experiment is limited to an attempt to determine whether global or insightful impressions by clinicians, who are experienced with projective methods, have significant reliability and validity.

Method

From 200 unselected cases in the files of a V. A. Mental Hygiene Clinic, ten cases were selected which, in the judgment of three judges, represented as wide a range of adjustment as could be achieved from the group. These ten cases fitted closest a predetermined list of criteria including severity of symptoms, disturbance of interpersonal relations, occupational adjustment, later hospitalization, etc. The subjects finally selected ranged from a "normal" subject to an hallucinated, delusional psychotic. After the ten cases were selected and ranked by unanimous agreement of the judges, their drawings were taken from the psychological files. Each subject had, during his original testing, been asked to draw a picture of a man and a woman on a plain sheet of 8½ by 11 paper. This variation on the test is in line with rather widespread clinical practice.

The drawings were then photocopied so that a number of copies of each drawing would be available for "paired comparisons"(1). Each drawing was then paired with each other drawing, the pairs being placed inside a manila folder. The order of presentation and the placement of the drawings were governed by considerations found to control most effectively position and series factors in experimental esthetics(6).

When the 45 pairs $\left[\frac{N(N-1)}{2}\right]$ of drawings had been assembled, they were presented, one pair at a time, to a number of clinicians individually with the instructions, "I am going to ask you to participate in an experiment on the reliability and validity of interpretation of drawings-of-a-man-and-woman. In these folders there are ten different drawings from adult, male subjects. There is no extreme variability of intelligence among these subjects. (The range in Wechsler-Bellevue Full Scale IQ's was 98-123.) Each drawing is paired with every other drawing, making a total of 45 pairs. With each pair, what I want you to do is to decide which drawing reflects the better-adjusted individual. By adjustment, I mean what is usually denoted by that term—psychosexual maturity, ability to get along with other people, and perception of reality in a way that agrees with our cultural standards. You may use any means you wish, and may study the drawings for as long as you like. I am not interested, in this experiment, in how you make the decision for each pair of drawings. All I want you to tell me is—which of the subjects' drawings do you feel reflects the better adjustment?"

Each judge then examined the 45 pairs of drawings and made a decision which he communicated to the experimenter. The judgments were recorded on a prepared sheet. The subjects were not informed, of course, of the validity of their judgments during the experiment. No "inquiry" or other additional material beyond the drawings themselves influenced the judgments.

Reliability. Fifteen clinical psychologists served as judges. All of the judges were post-doctoral, nine of them diplomates. All have had many years of clinical experience. The amount of experience with drawings as projective techniques varied; for purposes of the present study, the judges were not selected as "experts" in the interpretation of such drawings. To determine the reliability of judgment, the judges were split into two groups, the opinion of the experimenter determining the separation of the judges (as suggested by Kelley(4)). Then, for each group of judges, the Mean Preference for each drawing was determined by the procedure outlined by Guilford(3). These Mean Preferences were converted into Scale Values, and a constant added so that the lowest Scale Value was (.000). After the Scale Value of each drawing had been determined for both groups of judges, a linear correlation between the groups was computed.

Validity. The question of validity of judgment rests on more precarious assumptions than does reliability. As stated above, the original case records were used to achieve as wide a range of adjustment as possible. However, objections as to the validity of the judgments of adjustment, even though the selections were agreed to by all judges, may reasonably be raised. And also, "adjustment" itself may have more than one dimension. Perhaps a psychotic in partial remission is "better-adjusted" than an anxiety neurotic. And lastly, even if the judgments of adjustment from the drawings are found to correlate with judgments from the case histories, for a group of only ten cases, how far can we trust this apparent relationship? We might reasonably expect that the wide range of adjustment in our sample would act to raise validity, though none of the drawings was extremely distorted or unrecognizable.

Recognizing these limitations, the validity was estimated using the rank-order correlation between the rank accorded the individuals as determined by their case-records, and the rank which represented the consensus of the fifteen judges. Tests of significance of both the reliability and validity coefficients were obtained. As a further check on our data, correlations were computed between the Wechsler-Bellevue Full Scale IQ's of the ten subjects and the rank of the drawings by the judges, and also the rank of the individuals from the case-records. This served to determine the effect of intelligence on the judgments of adjustment made from the drawings.

Results

Reliability. The linear-correlation between the two groups of judges described above was found to be .955. This value is significant at the one percent level. (With eight degrees of freedom, r must be .765 at the one percent level.) Applying the Spearman-Brown formula to this correlation raises its value for the whole group of judges to .977.

Validity. The rank-order correlation between the rank-order of the drawings as judged by the fifteen clinical psychologists and the rank of the individuals in adjustment as determined from the case records was found to be .624. This is approximately equivalent to a product-movement r of .640 which for eight degrees of freedom is significant at the five percent level of confidence. The linear correlations between Wechsler - Bellevue Full Scale IQ's and the rank-adjustments determined by the case-records, and by the judgments of drawings, were both negligible and insignificant. This would suggest that factors other than intelligence were operative to determine the qualities of the drawings which led to the judgments of adjustment.

Conclusions

From the results obtained, it appears that clinical psychologists can make reliable judgments of "global adjustment" from drawings-of-a-man-and-woman under conditions of the present experiment. The reliability coefficient obtained is sufficiently high to warrant rejection of the Null hypothesis. However, from other data, not yet completely analyzed, it appears that non-clinical psychologists, not experienced in projective techniques, can make as reliable judgments. The authors are of the opinion that quality of drawing rather than any more complex factors, is operative in producing this reliability, and investigation of this hypothesis is in progress.

The results with respect to validity are less definite for the reasons noted above. However, from the results obtained there is rather convincing evidence that the judgments of adjustment determined from drawings agrees with the adjustment of the subjects determined by the case records. Certainly the results are sufficiently promising to warrant continued use of the technique, and further investigation which would answer some of the questions related to the basis of this validity.

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DRAWING CHARACTERISTICS OF NEUROTIC PATIENTS USING A DRAWING-OF-A-MAN-AND-WOMAN TECHNIQUE[1]

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INTRODUCTION

In the past, drawings of the human figure have been used chiefly as a measure of intelligence in young children. Goodenough's[5] list of scoring points for the drawings of a man has proved adequate for estimating the approximate intelligence rating of children from the ages of five to ten. Currently a drawing-of-a-man-and-woman technique is being used on a tentative basis in some mental hygiene clinics and Veterans Administration hospitals as a projective technique in the appraisal of adult personality. In the absence of experimentally defined scoring points for the technique, the interpretation of the meaning of any drawing characteristic has relied largely upon clinical "intuition" and experience generally with projective methods.

The drawing-of-a-man-and-woman technique when applied under standardized test conditions seems to offer a simple uninvolved task to the subject. Nevertheless the drawing of concepts so universally known and appreciated presents great individual differences evident even to cursory inspection. Idiosyncrasies of drawing behavior may often be linked rationally with clinical or autobiographical characteristics of the subject. The question is pertinent whether these idiosyncrasies of drawing behavior apply consistently to the "type" of personality of the individual who draws a man and woman. More specifically one may ask whether a mental patient presenting a certain syndrome can be expected validly to draw his man and woman in a manner distinguishable in some respects from symptom-free subjects.

This study proposes to determine whether or not the drawings of a man and woman by a group of anxious neurotic patients may be significantly differentiated from a group of relatively symptom-free subjects on the basis of drawing characteristics common to the anxious neurotic group. The study proposes to examine some drawing characteristics that are differential between the two groups and determine their value when used as individual scoring points and when combined into a scale.

METHOD

The drawing-of-a-man-and-woman technique was applied to two groups, one composed of anxious neurotic patients, and the other of control subjects. Both groups consisting of male, white, World War II veterans were equated for age and intelligence insofar as possible. The experimental group of 80 patients from a mental hygiene clinic and Veterans Administration hospital had been diagnosed as anxiety neurotics or anxiety states by psychiatrists. The control group of 100

1. Taken from a master's thesis submitted to the University of Pittsburgh in partial fulfillment of the requirements for the degree of master of science.

2. Published with permission of the Chief Medical Director, Department of Medicine and Surgery, Veterans Administration, who assumes no responsibility for the opinions expressed or the conclusions drawn by the author.

subjects, volunteers from a dental clinic, were free from overt anxiety and "nervousness."

Both groups were split in half so that two anxious neurotic and two control groups were formed approximately equal in age and intelligence. Drawings of the first halves of each group were scored using a preliminary check list of 28 drawing characteristics as follows:

1. Distance between figures.
   a. "Appropriate" separation of figures.
   b. Widely separated figures.
   c. Proximal figures.
2. Pencil pressure.
   a. Firm lines.
   b. Faint lines.
   c. Heavy lines.
   d. Combination of firm and light lines.
   e. Combination of firm and heavy lines.
   f. Combination of firm, light, and heavy lines.
3. Form of head and trunk.
   a. "Representative" form of the head and trunk.
   b. Circular (or oval) form of the head and trunk.
   c. Square (or rectangular) form of the head and trunk.
4. Obvious erasures. Presence or absence.
5. Continuity of lines.
   a. Wholly continuous body and clothing outlines in both figures.
   b. One or two discontinuous lines in either figure.
   c. Three or more discontinuous lines in either figure.
6. Ascendancy. Man, woman, or indeterminate.
7. Relative size of the man and woman. Man, woman, or indeterminate.
8. Rotation of paper. Rotation or compliance with instructions.
9. Regularity of lines.
   a. Long smooth straight or curved line sectors of the body outline.
   b. One or two markedly irregular, crooked, or "wobbly" line sectors in a figure.
   c. Three or more markedly irregular, crooked, or "wobbly" line sectors in a figure.
10. Single line and multi-line drawings.
    a. Single line drawings.
    b. One or two multi-line or "sketched" sectors of line in a figure.
    c. Three or more multi-line or "sketched" sectors of line in either figure.
11. Length of figures.
    a. "Proportional" figures.
    b. "Expansive" figures.
    c. "Constricted" figures.
12. Sex of the figures.
    a. Sex of the left hand figure with two figures drawn.
    b. Sex of an only figure.
13. Missing and hidden hands.
14. Relation of the man's arms to his body.
    a. Both arms at the side of the body.
    b. Both arms away from the body.
    c. Marked elevation of both arms.
15. Relation of the woman's arms to her body.
    a. Both arms at the side of the body.
    b. Both arms away from the body.
    c. Marked elevation of both arms.
16. Top-bottom symmetry of placement.
    a. Equal head-foot distance for both figures.
    b. Both figures asymmetrical in top-bottom placement.
17. Left-right symmetry of placement.
    a. Equal left-right placement of figures.
    b. Asymmetrical left-right placement.
18. Shading of the hair. Presence or absence.
19. Shading of the body or clothing (other than the hair). Presence or absence.
20. Incomplete figures.
    a. Incompleteness with closure in either figure.
    b. Incompleteness without closure in either figure.
    c. "Chopped off" figures.
21. Nudity of figure. Presence or absence.
22. Inclination of either figure from the vertical axis of paper. Presence or absence.
23. Direction of the man's head. Toward woman, facing front, or away from woman.
24. Direction of the woman's head. Toward man, facing front, or away from man.
25. Combination of 23 and 24. Direction of heads.
26. Transparencies. Presence or absence.
27. Base-line dependency. Presence or absence.
28. Movement. Presence or absence.

The selection of items for the check list depended partially on clinical "hunches" derived from superficial examination of the drawings. Other items were adapted from suggestive differential characteristics reported in the literature[1, 2, 3, 4, 6, 7, 8, 9, 10]. A difficulty encountered in establishing scoring points to fit the drawing characteristic was to devise an objective method of rating the characteristic in order that it might be scored reliably. Some of the points from the outset determine simply the presence or absence of a drawing characteristic. Other points in the preliminary list define a characteristic through several degrees of its representation and seemed to permit relatively fine discrimination. Ultimately, however, the differentiation most practical for scoring and statistically the most significant came with the representation of all scoring points in a simple dichotomy whereby the drawing char-

acteristic could be demonstrated as present or absent.

The discriminatory value of each dichotomous scoring point in differentiating between the first halves of the groups was determined by computing, using the chi-square formula, the probability that the particular arrangement of frequencies in the halves arose by chance.

The points on the preliminary check list which tentatively offered the probability of the greatest differentiation through application to the first halves of the groups were applied to the scoring of the second halves. Scoring points which consistently gave the greatest differentiation between both halves of the groups on the basis of low P-values were retained for further analysis.

For these points the percentage of their occurrence in each group, standard errors, differences in percentages, and critical ratios were computed. Those scoring points were retained which offered the greatest differentiation between groups on the basis of critical ratios. These points were combined to form a final scale. The mean number of points present in each half of the groups was computed. Point bi-serial correlations determined the degree of relationship between the points in combination and the particular frequency distributions of the groups.

Frequency distributions obtained in both halves of the groups were converted to cumulative percentages and aligned to determine by inspection what number of combined points was most suitable as a cut-off score in differentiating the largest number of anxious neurotics and the least number of control subjects. Six of the next best differential items from the preliminary check list which were differential only between the first halves of the groups were added to the 8-point scale to determine by inspection what cut-off score of this 14-point scale differentiated the most anxious neurotic patients and the least number of control subjects.

Results

Eighteen of the scoring points on the preliminary check list offered the probability of relatively great differentiation between the first halves of the groups with P-values of .30 or less. When these were applied to the second halves of the groups, eight maintained their large differential value with P-values of .20 or less.

The eight drawing characteristics, as defined in this study for the scoring of drawings by anxious neurotic and control subjects, may be summarized in terms of the greater frequencies displayed by the anxious neurotic patients:

1. The distance between the figures tends more often to be greater than two inches.
2. Pencil pressure tends more often to be characterized by the absence of heavy lines.
3. The form of the head and trunk more often tends to be rectangular or circular.
4. More obvious erasures are present.
5. Lines of the body and clothing outline tend more often to be wholly continuous.
6. One of the figures tends more often to be placed on a higher or lower plane than the other.
7. One of the figures tends more often to be of greater or less length than the other.
8. Rotation of the paper tends more often to be evident than compliance with instructions.

Critical ratios computed from the difference in percentage of occurrence of each of the eight points in both halves of the groups indicated that none of the points individually offered certainty that the differences were significant. Critical ratios for each of the eight points were not less than 1.2 for either half-comparison. These data are summarized in Table 1.

When the eight points were combined into a scale, computation of the mean number of combined points present in the halves indicated a difference of approximately one scale point between both halves of the groups. This difference in terms of the frequency distributions involved was a significant one, indicating a substantial relationship between the points in combination and the particular ar-

TABLE 1. *Showing P-values and critical ratios for the eight scoring points chosen for their differentiating values*

	Scoring Points							
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
P-values								
1st Halves	.02	.05	.10	.05	.02	.10	.20	.30
2nd Halves	.00	.10	.05	.20	.20	.20	.20	.00
Critical ratios								
1st Halves	2.4	2.2	1.8	2.2	2.6	1.9	1.6	1.2
2nd Halves	3.5	1.7	2.1	1.5	1.4	1.4	1.6	2.7

rangement of frequencies in both halves of the groups. Point bi-serial correlation coefficients for the first and second halves of the groups, respectively, were .40 and .41.

Conversion to cumulative percentages of the particular frequencies arising in both halves of the groups using the 8-point scale indicated by inspection that a cut-off score of any five points seemed best for differentiating the largest number of anxious neurotics and the least number of control subjects. In the first halves of the groups 35 percent of the anxious neurotics and 6 percent of the control subjects display this number of points or more. In the second halves 25 percent and 4 percent, respectively, display this number of points or more.

The addition of six other points to the 8-point scale demonstrated that a cut-off score of any eight points was best for differentiating the largest number of anxious neurotics and the least number of control subjects. In the first halves of the groups 55 percent of the anxious neurotics and 4 percent of the control subjects display this number of points or more. In the second halves 40 percent and 8 percent, respectively, display this number of points or more.

CONCLUSIONS

None of the particular drawing characteristics as defined and scored in this study are statistically significant as individual scoring points for the differentiation of the drawings of anxious neurotic patients and control subjects. However, a tendency toward significance is noted for eight of the drawing characteristics. The least differential of these items offers 88 chances in 100 that the difference is significant. The combination of these eight points into a scale indicates that its application offers a more significant and practical means of differentiating between groups on the basis of cut-off scores. In view of the limited number of drawing characteristics studied and the relative crudeness of their definitions for scoring, it seems possible that a more thorough analysis of the drawing-a-man-and-woman technique may yield a scale of selected scoring points which will have maximal value in differentiating between groups of anxious neurotic patients and control subjects, relatively free from symptoms.

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A GOODENOUGH SCALE EVALUATION OF HUMAN FIGURES DRAWN BY SCHIZOPHRENIC AND NON-PSYCHOTIC ADULTS

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Introduction

There is considerable interest at the present time in the use of human figure drawings as a projective technique. Many clinicians favor its use because of ease of administration, brevity, and simplicity. However, due to the limitation of present knowledge of the technique, there is confusion in interpreting the results. Frequently drawings have been adjudged in terms of the theories of the projective techniques and of general psychological principles. In order to justify the continued use of this instrument it would appear that some attempts to objectify the results obtained thereby would be clinically useful. Accordingly this study was proposed wherein the drawings of a seriously disturbed group of patients would be compared with those of a group not disturbed. The present interest is to determine whether human figure drawings, when scored according to an objective standard, would discriminate between groups of schizophrenic and non-psychotic persons.

The standard which suggests itself is the Goodenough scale. Although it was developed to measure the intelligence of children, it is believed that this scale may be applicable to the present problem since some of the characteristics of schizophrenic thinking are said to resemble a regression to a childish mode of thought, a turning away from reality, a complex-dominated type of thinking and a progressive personality disintegration. It is believed that the childish thinking and the general regressive behavior associated with the effects of schizophrenia will be reflected in a lower point score for the psychotic group than for the control group. When Goodenough[1] developed her scale, she was aware of the possibilities of understanding personality factors based on the drawings. She felt that further study in reference to mental disorders would be fruitful. In another study[2] she refers to the work of H. Prinzhorn who emphasized the infantile characteristics found in drawings of markedly deteriorated schizophrenic patients. Hinrichs[3] used the Goodenough scale in his study of delinquents and problem behavior. He felt that the method offered greater possibilities than merely assessing points. Judges were asked to consider the qualitative aspects of the drawings. In these subjective judgments a consistency of opinion was obtained, and the presence of abnormal or undesirable personality traits was markedly evident. He concluded that he does not know what it is that is measured by the Goodenough scale. A recent investigation[4] in the use of the drawings has been reported, but the material was not available for the present study.

Method

The subjects for this study comprised two groups. The experimental group consisted of 57 white male patients in two mental hospitals and a mental hygiene clinic. In each case a diagnosis of schizophrenia, or dementia praecox, had been made on the basis of social history, psychological and psychiatric examinations. No patient had been hospitalized or under treatment for longer than three years. Seven drawings were disregarded because of the patient's unwillingness or inability to produce a recognizable and scorable human figure. Drawings with zero scores were not used.

The control group was made up of 109 white male veterans of World War II who were in a reception room awaiting dental treatment or an appointment for treatment. Of these drawings, nine were excluded from the study because the subject admitted having received treatment at some time for "nervousness."

The members of each group of sub-

jects, voluntarily and individually were asked to draw a man, or a man and woman, or a person, according to the particular clinic or hospital preference. The directions were unstructured except that occasional encouragement might be given as, "do the best you can," or "draw all the man," or "draw the complete person."

Only the male figure was used for this study. A total of 150 drawings were scored, following the procedure in the Goodenough manual. When all had been scored, the first fifteen were rescored, for a consistency check. A product-moment correlation of .96 was obtained. The groups were equated for age at time of drawing, and highest school grade completed so that these variables might be controlled. A total of 39 pairs were matched and were the basis for the findings. Twelve pairs were matched exactly. Thirteen pairs had one year's difference in either age or education, with five pairs varying one year in both age and grade completed. Four pairs had a two-year difference in age, or in education, or both. The remaining five pairs were more extreme.

Results

The means, standard deviations and standard errors of means were computed for each group for age at time of drawing, highest school grade completed, and Goodenough point score. Critical ratios were determined to investigate the significance of differences obtained. The statistics indicate that the mean age of the control group was .25 years higher than the experimental group. The critical ratio was .17. The difference between the groups does not approach significance.

The mean educational level of the control group was .46 grade higher than the experimental group with a critical ratio of .95. The Goodenough point score of the control group is 1.93 higher than the experimental group, with a nonsignificant critical ratio of 1.11.

Conclusions

The results of this study as reported are negative in nature. Human figure drawings as drawn by schizophrenic patients and scored by the Goodenough scale are not significantly different from those of a non-psychotic group. The similarity of the groups in age and in educational attainment suggests that these variables are equated in each case and do not influence the drawing score. Since there are no differences between the groups which approach significance, the conclusion is that human figure drawings as used in this study will not discriminate between the drawings of a psychotic group and a non-psychotic group. Because of the size of the critical ratio, it is not likely that the Goodenough scale will discriminate between larger groups of subjects. The chances are slight that any significant difference will be obtained by this method.

TABLE 1. *Showing age, highest grade completed, and Goodenough point scores of control and experimental groups*

	Control group N — 39	*Experimental group* N — 39
Age at time of drawing:		
Range	19-42	18-42
Mean	29.29	29.04
S.D.	6.42	6.52
S.E. of mean	1.03	1.04
Highest grade completed:		
Range	7-16	4-16
Mean	10.46	10.00
S.D.	1.86	2.36
S.E. of mean	.30	.38
Goodenough point scores:		
Range	8-45	5-42
Mean	31.62	29.69
S.D.	7.38	7.91
S.E. of mean	1.18	1.27

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THE EFFECT OF MENTAL AGE AND ETIOLOGY ON TWO FACTORS IN FORMBOARD PERFORMANCE[1]

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INTRODUCTION

It has long been hypothesized that, contrary to the general practice in research and administration, the mentally deficient are not a homogenous group. In the past decade etiological differences in some aspects of behavior of the mentally deficient have been demonstrated[3, 6, 7, 16, 21, 22]. In addition to the many practical implications, some of which have been set forth by Doll[3], these differences may give further insight into the fundamental nature of mental deficiency. Throughout the past several years the Research Laboratory staff of the Training School at Vineland has been devoting an increasing amount of its time and energies to a consideration of the nature and extent of these etiological differences. One of the methods of attack upon this problem is the re-evaluation of old and new psychometric devices or modifications thereof, in the light of this new trend in research. The present study deals with one of these devices, the formboard. Part I treats with a description and exposition of a modification of the Witmer Formboard; Part II discusses etiological differences in performance on this test.

PART I. THE WITMER FORMBOARD MODIFIED

Materials. The simple formboard of the Witmer type has been a standard clinical tool for over thirty years[5, 24], but opinions vary as to the factors involved in the task. Although Norsworthy[12, p. 25], the first to use this kind of board as a testing device, considered it a measure of form perception and rate of movement, others[15, 17, 18, 23, 24, 26] have subsequently suggested a multitude of possible factors. The current tendency among many clinicians is to speak merely of "formboard performance" with little or no attempt to analyze of what it consists. The present writer undertook the task of trying to isolate two of the factors involved in completing the formboard. Part of the total time taken to complete the formboard obviously consists of time used to move the blocks to the proper recesses. This speed of movement or motor speed can be isolated and measured by a simple formboard. Both Murphy[10] and Muscio[11] have attempted a similar technique.

A special board, called the Speed or S board has been constructed, having eleven circular recesses, each recess accommodating a circle block the same size as the circle block on the Witmer, as described by Young[25]. In overall dimensions, the S board is the same size as that part of the Witmer containing the recesses. The arrangement of recesses in the S board is not identical with that of the Witmer, but we believe the difference to be not significant. The circle was selected because it apparently represents the geometric figure first recognized in the maturation process. It was reasoned that the time taken to place eleven circles

1. The writer is indebted to Dr. E. A. Doll for guidance and aid in the evaluation of results and to Mr. H. S. Danenhower for persistent encouragement over an extended period of time.

in eleven recesses essentially represents the motor speed involved in placing the blocks of the Witmer Formboard. However, it is obvious that such a device cannot be said to measure all the motor speed involved in formboard performance for there is clearly less manipulation necessary to place a circle than to place some of the other blocks, the star, for instance.

Another obvious factor involved in formboard performance is form perception. When using the Witmer Formboard it has been the observation of this writer that some subjects, when unable to place a particular block, lay it aside, place the other ten blocks, then proceed to fit the difficult block into the only remaining recess. On the Witmer, the number of possible blocks and the number of possible recesses decrease each time a block is placed. It was reasoned that if some means were found of always confronting the testee with eleven possible recesses instead of a decreasing number, a purer measure of form perception (except for placements due to chance) would be had. With this in mind the writer constructed a frame with a hinged bottom, which stood 6.75 inches above the table surface. On this frame fitted the S board and the recess part of the Witmer Formboard (hereafter referred to as the W board). Thus, when using the W board, the examiner can drop each piece through the bottom as it is placed, the testee always being confronted with eleven possible recesses.

Method. The next step was to test this board in the clinical situation. The administration procedure devised was as follows: Testee (T) stands before a table on which the frame with the S board is placed. Examiner (E) confronts T with S board which has all the circles piled on the tray in five piles of two each and one pile of one. E says, holding up a circle, "These circles are all the same size." At this point, E places a circle in each of three recesses to demonstrate what he is saying. "Now use one hand and put the circles in the holes as fast as you can. Go ahead." E holds the bottom of the board steady so that circles will not drop through and starts to time as soon as T touches the first block. For subsequent trials E says, "Let's see if you can do it even faster." When finished with S board E takes three circles and says, "Now I'm going to put the other board (indicating the W board) on and this time every time you put a block in, I'm going to drop it out the bottom like this (demonstrates). Don't worry about where the bottom is; you just keep putting the blocks in as fast as you can." The W board is substituted for the S board and the blocks are changed. "Now go ahead." Prior to each subsequent trial E says, "Now let's see if you can do it even faster." There is no special order of arrangement of the blocks in the tray. Test is failed if board is not completed in five minutes.

Before attempting a study of any large extent with this test, some indication of its reliability was considered necessary. It is well known that much improvement in formboard performance obtains with practice[8, 9, 13, 17]. It is obvious that were this test unreliable, further work on it would not be justified. There is also much disagreement as to the number of trials and how to evaluate them[5, 12, 13, 14, 20, 24, 25]. It was believed by this writer that a test-retest study with this device would not only serve as a rough estimate of the general reliability of the test but might also show any particular advantages or disadvantages in the use of any one trial or combination of trials as a means of evaluating performance on the test.

In selecting a population for this study we were immediately confronted with the problem of what MA and LA ranges and what etiological groups to use in our sample so as not to prejudice reliability results. Since no information on this problem exists in the literature and since a thorough study of the point would be a major undertaking in itself, it was felt that by taking the total population of three cottages at The Training School, regardless of the MA, LA, or etiological groups of the subjects, a rough, yet adequate for our purposes, estimate of reliability could be obtained.

A total of 38 boys, representing the populations of three cottages (less several

children who missed one of the administrations because of unavoidable circumstances, was selected to constitute our reliability group. The range of 1916 Stanford-Binet MA of this group was from MA 3.2 to 11.7 years, with a median of 5.5 and a Q of 1.3; the range of LA of this group was from 7.3 to 23.3 years with a median age of 11.1 and a Q of 3.1. All of the subjects were diagnosed as mentally deficient or potentially so, except three, who had been diagnosed as borderline. Etiologically and in terms defined by Doll[2], there were eight endogenous, four mixed, fifteen exogenous (exclusive of the special clinical types), four mongolians and four of undetermined etiology. These boys were given two administrations (three trials per board, per administration) of this test, the second being from two to three weeks after the first.

Results. The results of the test-retest study are listed in Table 1. A consideration of the raw data did not indicate any particular relationship between etiology and reliability. Nevertheless, several things may be seen from Table 1. First, in spite of the rather nondescript sample and the use of Rho (a rather gross measure of relationship) the test gives promise of being fairly reliable. Secondly, it would seem as though it will make little difference what trial, on either board, is used to indicate the performance of the subject. Thirdly, it may be seen from the median trials on each board that in this group there was little variation in performance from one administration to the next on the S board, but the retest medians on the W board are much lower than the first administration medians. If these results may be generalized, the sizeable "improvement" in performance on the formboard tests, previously reported in the literature, may be merely gain in form perception rather than in motor speed. It was also observed that the higher grade subjects, for whom the S board was very easy, tended to lose interest in the third trial.

In view of the above data, we decided to use the shortest of two trials as indicative of performance on the S board and to use the average of three trials on the W board as indicative of performance. This method would tend to lessen the effect of the short time score of any one trial which might be due to the chance placement of a difficult block.

The data in Table 1 also show the middle range of the S distribution to be about five seconds. According to the Witmer Formboard norms[25, p. 106] five seconds make the difference between median performances for LA's 9.75 to 14.5 or 7.25 to 9.25. Thus, it is possible that the difference between median scores for certain LA's on the Witmer Formboard is but a reflection of individual variability in motor speed. This finding might explain Doll's[2, p. 61] conclusion that the formboard as a mental age test is not valid after MA seven.

Since it is believed that the shortest of two trials on the S board (the S score) essentially represents the subject's speed of movement, then the average of three trials on the W board less the S score

TABLE 1. *Test-retest reliability results*

	N	*Md. 1**	*Md. 2**	*Q 1*	*Q 2*	*Rho*	*P.E. Rho*
Speed (S) Board:							
Shortest 1st 2 trials	38	14	14	2.5	2.5	+.93	.015
Second trial	38	14	15	2.7	3.0	+.90	.020
Shortest 3 trials ..	38	13	14	3.0	2.5	+.92	.016
Average 3 trials ..	38	14	15	3.5	2.7	+.96	.008
Witmer (W) Board:							
Shortest 1st 2 trials	38	46	37	15	11	+.86	.029
Second trial	37	48	38	16	10.5	+.86	.030
Shortest 3 trials ..	38	41.5	34	13.5	11	+.84	.032
Average 3 trials ..	36	53.5	39	16.5	12.5	+.91	.019

* 1 refers to first administration and 2 refers to second administration.

(which we indicate as the W-S score) should represent essentially the time taken by the testee to determine the proper placement of the blocks or what might be called his form perception time.

Part II. Etiological Implications

In the first paragraph of this study, attention was called to the fact that workers in the field of mental deficiency have begun to discover behavioral differences between endogenous and exogenous feebleminded subjects. As yet, the number of studies is small and although there have been few attempts at validation of these studies through replication, the results appear to be of great consequence. There is sufficient evidence to suggest that on the present formboard test, etiological differences might be apparent in form perception and motor speed scores. Therefore, in choosing our trial population only endogenous and exogenous subjects were selected.

This test was administered to 59 endogenous and 70 exogenous feebleminded subjects, all of whom were male. The median LA and MA, respectively, of the endogenous group were 14.4 and 7.5, with Q's of 3.1 and 1.5. The corresponding medians for the exogenous group were 17.7 and 7.2, with Q's of 6.25 and 1.25. We believe these data show the two groups to be reasonably well equated in terms of MA.

Before comparisons of performances can be made, some way had to be found to group the scores on these two boards into intervals. The range of scores was so large and contained so many extreme deviations that it rendered impractical the use of most statistical techniques. It is obvious that a difference of one second in time for completing the formboard is mathematically the same at the low end of the scale, as at the high end, but it is not an equal interval psychologically. In this sense, one second, representing the difference between the W-S scores of nine and ten seconds, is very much more important than one second, representing the difference between the W-S scores of 76 and 77 seconds.

A very simple means of converting the scores of these two groups to a logarithmic scale was adopted. The range of the distribution was computed. Each step in the range was then ranked in accord with its position in the total range, *e.g.*, the first interval received a rank of one, the last a rank of N, etc. By dividing the range into 100, a factor was obtained which is multiplied by the range rank of each raw score. The products thus obtained represent the positions of the raw scores on a scale of 100 equal units. This position is the logarithm of the final or converted score. Thus, by employing a table of natural logarithms, it is easy to read off the converted score. The ultimate value of this method is to make the intervals of the total raw score distribution unequal, although the intervals of the distribution in terms of converted scores are equal. For example, on the S distribution and in terms of raw scores (seconds) the first interval is from six to seven seconds, whereas the last interval is from 26 to 33 seconds. All of the statistical work involved in evaluating performance on this test was done using the converted scores. But, since these converted scores will be meaningless to the reader, all results discussed hereafter will be expressed in terms of seconds.

We are also confronted with the additional problem of the factors of MA and LA which might affect formboard performance. A survey of the literature reveals that those who work with normal children generally compare formboard performance with LA and those working with subnormal children compare it with MA. It is obvious that those working with normal children tacitly assume that their subjects have a normal MA for their LA. But, it is logical to expect LA to be of small, if any, importance in formboard performance of mentally deficient subjects, except for very young children. Thus, in the present exogenous group, the product-moment r between LA and MA is $+.15$, $\pm.11$ (standard error), which means the correlation is not significant. Wallin[19, p. 28] used the Seguin Formboard with subnormal subjects ranging in LA from four to 16. Although he concluded that both LA and MA were related to formboard performance, he emphasized the fact that the average in-

crease in formboard performance time per unit of MA was much larger for the subnormal group than the average increase in formboard performance time per unit of LA for both his normal and subnormal groups. This clearly indicates the primary variable in formboard performance of subnormals to be MA and it is with this variable that we shall be concerned in this study.

In considering the performance of these two groups on this test, it was necessary to inquire into the relationship between the W-S and S scores. If these two scores varied together, there would be little gain in diagnostic value by considering both instead of one score. The partial correlation between the W-S and S score (MA held constant) was found to be +.313 and +.276 for the exogenous. These coefficients seem to indicate that the degree of relationship between the W-S and S scores is insufficient to warrant the possibility that these two scores represent estimates of the same factor.

On the W board, that is, the Witmer Formboard modified by a drop bottom, the median scores for the endogenous and exogenous were 30 and 41 seconds respectively, with corresponding Q's of 6 and 17. Using the formula suggested by Garrett[4, p. 207] for determining the standard error of the median (normality of the distribution not assumed) a critical ratio of 4.3 was found to obtain. This is interpreted to mean that the difference in medians is real and not due to chance. In other words, the endogenous as a group had a reliably better W score.

The product-moment correlation between MA and W score was, for the endogenous, +.750, ±.056 and for the exogenous, +.341, ±.014, with a critical ratio of the difference between the two *r's* of 7.2, showing it to be reliable. An analysis of the scatter diagrams shows that in the endogenous group, of the 39 subjects above MA 6.4, only one had a W score of more than 43 seconds, whereas of the 46 exogenous subjects of MA over 6.4, twenty-three, or half, had a W score over 43 seconds. The score of 43 seconds, then, is tantamount to a "cutoff" score. Given a subject of MA 6.5 or over and a W score of more than 43 seconds, we may reasonably infer that he is not endogenous.

It is possible that even though there is a statistically significant difference in performance between these two etiological groups in W score, this difference might be due to just one of the factors—perhaps motor speed or form perception — involved in completing this board. Therefore, the medians of the two groups on the S or speed board were calculated and found to be 10 seconds for the endogenous, and 13 seconds for the exogenous, with corresponding Q's of 1.5 and 2.0. Proceeding as in the case of the W score, a critical ratio between the median S scores was computed and found to be 4.2. This is also interpreted as being statistically reliable and representing a real difference between these two groups in S score.

The relationship between S score and MA was found to be fairly high for both groups, the product-moment correlation coefficient being +.719, ±.062 for the endogenous, and +.612, ±.074 for the exogenous. Both coefficients are significant. Although, the difference between the *r's* was not found to be reliable (C. R. of 1.11) and even though both *r's* are high, there is quite a bit of difference between the actual S scores of both groups. The difference is best shown by Graph I, where the median scores per MA group[2] of the two etiological groups are plotted. It can be seen easily that starting with MA six, a definite endogenous superiority obtains. The correlation coefficients show the relationship between MA and S scores for both etiological groups to be high, but Fig. 1 shows the endogenous speeds to be definitely above the exogenous speeds. An analysis of the actual speed scores shows 13 of the endogenous, but none of the exogenous subjects to have an S score of less than nine seconds and it shows none of the endogenous and five of the exogenous to have an S score in excess of 20 seconds.

The form perception or W-S scores remain to be considered. The median W-S score for the endogenous group

2. In no MA group was N less than six.

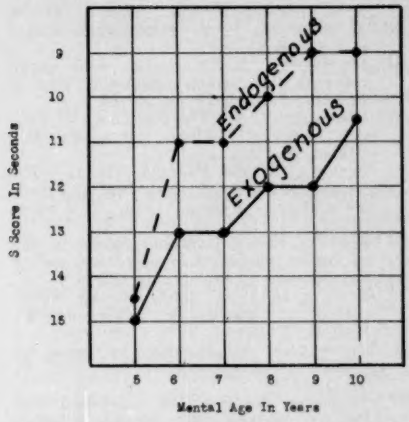

FIG. 1. Median motor score per MA groups of exogenous and endogenous cases.

was found to be 19 seconds and for the exogenous group, 28 seconds, with corresponding Q's of 4.5 and 16.5. The critical ratio of the difference between the two group medians was found to be 3.2, which shows the difference in median performance of the two groups to be reliable. Thus, our data show a reliable difference between the median scores of the two groups in W score, S score, and W-S score.

The W-S scores were found to be related to MA for the endogenous group, but not for the exogenous group. The correlation coefficients in this instance were $+.640$, $\pm.076$ for the endogenous and $+.288$, $\pm.109$ for the exogenous. The relatively large standard error of the exogenous r shows it to be not significant. Thus, we may feel confident that the difference in correlation coefficients is reliable. As in the case of the W and S scores, an analysis of the MA and W-S score scatter diagrams reveals a "cutoff" score. Of the 38 endogenous subjects, with MA over 6.4 years, only one had a W-S score in excess of 26 seconds, whereas of the 46 exogenous subjects of MA over 6.4 years, 19 had a W-S score over 26 seconds. With a subject whose MA is over 6.4 and whose W-S score is in excess of 26 seconds, the inference may be made that he is not of endogenous etiology.

It is worthy of note that MA 6.4 represented the MA at which the so-called "cutoff" in W and W-S scores was found to obtain. Beyond this MA level we found that endogenous subjects did not go below a certain time in seconds. This is in accord with the results of other research at the Vineland Laboratory, in that etiological differences have not been evident in test performance before the subject reaches an MA level of six or seven. Moreover, this finding might be related to that of Benda[1, p. 54], who did autopsies on endogenous children and found the brain volume of his subjects to be less than that of normal subjects, but that these differences in brain volume were more marked in the MA groups above 6 years.

The above data add further to the small, but increasing amount of evidence showing that the large class of persons termed feebleminded is not homogeneous, but is instead, composed of at least two homogeneous sub-groups. If we are correct in our belief that the W-S score essentially represents form perception speed, then the above formboard test would seem to be of real import. It may now be concluded that the exogenous feebleminded are relatively poor in form perception and speed of movement. These findings should also have educational implications, not only with regard to methods of teaching, but also regarding actual curriculum content. Since the exogenous subjects appeared to be somewhat poor in form perception and motor speed, two questions may be posed: (a) Should they be given more or less training requiring these abilities? (b) Are they capable of learning in these areas, or would an increased amount of training prove futile?

CONCLUSIONS

1. The evidence indicates that formboard performance has been resolved into two quantitative factors, motor speed and form perception.

2. The evidence concerning motor speed suggests that the differences in median scores on the Witmer Formboard norms at the higher life age levels may be primarily differences in motor speed.

3. Etiological differences in performance were found to obtain, thus suggesting that the feebleminded cannot be considered as a single homogeneous group.

a. The endogenous group was found to perform significantly better than the exogenous group on total formboard score, form perception score, and motor speed score.

b. Motor speed appears to be maturational for both groups.

c. Form perception appears to be maturational for the endogenous group, but is not so clearly related to MA in the exogenous group.

d. Certain minimum or "cutoff" performances were found to obtain for endogenous subjects with MA in excess of 6.4.

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THE PSYCHOLOGICAL SCORES OF MENTAL PATIENTS IN AN INDIVIDUAL AND GROUP TESTING SITUATION*

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INTRODUCTION

In order to evaluate therapeutic procedures by means of psychological tests, the investigator felt that better standardization and objectivity would result if patients were tested in a group situation rather than in an individual one. Clinical experience with psychotics and severe neurotics in interviewing, testing, and activity therapy situations suggests strongly that patients' attitudes and motivations can be altered considerably by the type of approach and the amount of emotional and intellectual energy expended by the therapist or examiner. Mute catatonic patients can, with the proper amount of probing, be made to talk. Fairly well-composed hysterics and severely depressed neurotics will often break down during individual testing situations. They will wring their hands, cry and ask for sympathy and help. Overt homosexuals and repressed homosexuals permit themselves to express their feelings directly by statements, coy attitudes and increased attention. In brief, transference and rapport factors such as love, hostility, aggression and fear will play an important role in the individual testing situation. If one accepts this, then he must be aware of the possibility that the examination of patients in the individual testing situations may show test changes which are due to shifts in the interpersonal relation between the patient and the examiner, as well as changes that would be due to a therapeutic agent which is being evaluated. The interpersonal factors play an even larger role when the psychologist must test the patient not only once before and once after treatment but several times during treatment and in some instances many times after treatment.

If the objective in the application of tests is to evaluate psychological changes which may result from the administration of a therapeutic procedure, then it appears that the group testing approach is a more suitable technique. Here is an instrument which will measure therapeutic effects which are expressed in situations which are closer to the social milieu than the individual testing environment, with its inevitable emphasis on the role of the examiner.

The arguments presented do not propose that group testing situations are equivalent to real life situations or that they entirely remove the examiner from exerting any effect upon the test results. In one situation, he plays a larger role in the test results than in the other.

A systematic investigation of the effect of the examiner-patient relations on individual test results is not only justified by its possible practical implications, but because of the published material relevant to this point[15, 16, 10, 12], a controlled investigation is now seen as a much needed guide to testing practice.

To verify the hypothesis that the psychological test scores obtained in an individual situation differ from those obtained in a group situation, and to offer a guide to testing practice, the following experiment was undertaken.

SUBJECTS

Twenty-two mental patients (21 psychotics and one chronic alcoholic without psychosis) were selected from the Lincoln State Hospital, Lincoln, Nebraska. In years the average age was 33.6, education 11.4, and length of hospitalization 3.7.

* One of the four experiments submitted in partial fulfillment for the degree of Doctor of Philosophy at the University of Nebraska. Abstract of this paper was presented to Psi Chi at the American Psychological Association meeting in Boston in May 1948.

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Procedure

In order to equate the factor of practice and to control the rapport factor, or to hold constant the accumulative effect of contact or rapport, the counter-balanced order of testing was applied.

Group I started with Battery I in an individual situation and finished with Battery II in a group situation.

Group II started with Battery II in an individual and completed Battery I in a group situation.

Group III started in a group situation with Battery I and finished in an individual situation with Battery II.

Group IV started with Battery II in a group situation and finished with Battery I in an individual situation.

The maximum time between batteries was 5 days and the minimum time was 2 days.

Battery I comprised the following tests:

Memory. Memory Paragraph[1], Word Pairs[6], and Word Association Tests[8].

Abstraction. Shipley-Hartford Abstraction[13], Categorization[2], Similarities[14], and Object Sorting Tests[4, 7, 9].

Personality. Rorschach Multiple Choice[5] and Szondi tests[3].

Attention and Concentration. Digit Span and Digit Symbol tests[14].

Battery II comprised the same tests employed in Battery I. Whenever necessary the administering or scoring procedures were altered to meet the requirements of group administration. The details of these modifications may be had by a request to the writer.

Results

The t tests shown on Table 1 indicate a reliable difference in functioning levels between the individual and group situations on the following tests:

Table 1. *The significance of the difference between tests administered in an individual and group situation*

Test	*No.*	*Mn. I.*	*Mn. gr.*	*Diff.*	*t**	*% sig level*
Immediate A. A. (memory)	22	7.81	7.31	— .05	.48	..
Delayed A. A. (memory)	22	8.81	8.13	— .68	.86	..
Immedate A. B. (memory)	22	4.81	5.86	1.05	1.67	20
Immediate distortion (memory)	22	2.54	1.13	—1.41	3.71	1
Word pairs	22	3.59	3.41	— .18	.28	..
Word assoc. recall	20	84.95	78.15	—6.8	2.21	5
Shipley-Hartford	22	4.22	4.27	.05	.001	..
Categorization	22	21.72	21.22	— .52	1.11	30
Similarities	22	9.41	9.00	— .41	.80	..
Object sorting total	22	24.31	21.31	—3.0	2.65	2
Object sorting conc.	22	1.04	.81	— .23	.66	..
Object sorting func.	22	2.54	2.23	— .31	.74	..
Object sorting abstra.	22	2.36	1.95	— .41	1.37	20
Digit symbol	22	8.63	7.63	—1.0	2.17	5
Digit span for.	22	6.50	6.59	.09	.39	..
Digit span rev.	22	4.27	4.73	.46	1.24	30
Rorschach H-E, poor responses .	22	4.17	6.02	1.87	2.63	2
Rorschach quick exp., poor responses	19	2.71	3.47	.76	1.69	20
Rejections	22	.50	1.91	1.41	3.00	1
C'K or K	22	.45	.13	— .32	2.46	5
CF	22	.36	.18	— .18	1.00	..
C'	22	.50	.23	— .27	1.23	20
F+	22	3.36	2.54	— .82	2.10	5
Fc	22	.45	.63	.18	1.28	20
C/F	22	.09	.27	.18	1.28	20
Szondi s+	22	.95	.45	— .50	3.33	1
Szondi p+	22	.18	.82	.64	2.37	5
Szondi m+	22	.70	.09	— .61	2.55	2
Szondi d—	22	.09	.50	.41	3.75	1
Szondi hy+	22	.45	.08	— .37	2.05	5

* Lindquist, E. F., *Statistical Analysis in Educational Research*, Houghton Mifflin Co., 1940, 257 p.

Memory distortion of Memory Paragraph (at the 1 percent confidence level).

Object Sorting Test (at the 2 percent confidence level).

Digit Symbol Test (at the 5 percent confidence level).

Rorschach Poor Responses (at the 2 percent confidence level). Item analysis of Rorschach Multiple Choice Test show the following significant differences:

Rejections (at the 1 percent confidence level).

F plus responses (at the 5 percent confidence level). Analysis of the Szondi Test shows significant mean differences on the following factors:

s plus and d minus (at the 1 percent confidence level).

m plus (at the greater than 2 percent confidence level).

the p plus and hy plus at the less than 5 percent confidence level.

Other interesting trends showing differences at greater than 20 percent level of significance were found on the following tests:

Immediate memory of the Memory Paragraphs.

Abstraction estimate from the Object Sorting Test.

Rorschach Multiple Choice using quick exposure[1] for poor responses, Rorschach C′ and Fc responses.

Discussion and Conclusions

The results indicate that mental patients examined in an individual situation give different psychological test results than when tested in a group situation. In the group situation the patient's memory capacity appears to vary from that expressed in the individual situation, since on two tests he improves (memory paragraph distortion is reduced and immediate memory for memory paragraph is improved) and on one (Word Association) his score decreases. The results also indicate that the group testing situation diminishes abstractive capacity and psychomotor ability (Digit Symbol scores were lower in group situation).

These batteries include tests which measure not only intellectual function but also emotional and social function. The assumption is made that it is possible to show personality trends or differences by means of isolated test responses. Traditionally, test responses obtained from such tests as the Rorschach are not interpreted beyond a single frame of reference which is the individual patient. It has been reiterated that one cannot interpret the meaning of a response unless the personality structure, or matrix in which it exists or expresses itself, is understood.

The writer does not feel that this problem can be solved dogmatically by assuming a positive or negative position. He feels that some personality tests do offer isolated variables which can aid in describing personality and its changes. In a previous study[11] it was pointed out that if the Rorschach test is accepted as an approach to personality, one may be able to use some of its concepts for the type of approach attempted here.

Analysis of the Rorschach responses shows that subjects tested individually reject fewer cards. This suggests that they are in better contact in the individual situation. Their F+ responses mean is higher, suggesting better reality contact in the individual situation. They show more C′ and K or more depressive and dependent signs in an individual situation. There is a tendency in terms of Fc, for them to be less cautious, sensitive, and perhaps, less paranoid in an individual situation than in a group situation. An interesting change which supports the hypothesis of some Rorschach workers is the increase in C/F response in the group situation. It is felt that C/F is an exhibitionistic type of response, or one which is used to hide intellectual confusion. On the other hand, CF, a measure of regressed affectivity, decreased in the group situation.

The investigator has used the same type of rationale in the analysis of the Szondi Test shifts (Table 1). Deri[3] claims that Szondi Test should be administered more than the number of times used in this experiment in order to obtain a reliable interpretation of the individual's personality. In view of these and other limitations, these interpretations must be considered as highly speculative.

1. In this method the ink blots are exposed for maximum of fifteen seconds.

It is interesting to note the agreement between the interpretative significance of some of the Rorschach data and the Szondi data. In both tests, factors related to oral dependent needs were reduced in the group situation, that is, m plus was reduced on Szondi and C′ on the Rorschach. There was a tendency for the patients to be less emotional in the group situation as shown by the lowering of the hy plus factor on the Szondi Test and lowering of CF choices on the Rorschach test.

Analysis of some commonly accepted components of rapport indicates that a large number of the psychological test shifts which occurred in this study are related to this factor. For example, clinicians would agree that dependency level, emotional control, suspicion, reality contact and sensitivity are important constituents of the rapport factor. Since this experiment indicates that it is possible to examine these factors and that they can be isolated, the writer concludes that study of the patient as he changes his interpersonal relationships from the individual to the group situation may offer data which will help explain the psychology of the rapport factor. If it were possible to obtain and measure rapport factors in the personality of the therapist as well as the patient, in each therapeutic situation, as noted in this study, then it might be possible to identify some of the factors which produce success in some instances and failure in others.

Summary

1. Psychological scores obtained in an individual situation differ from those obtained in a group situation.

2. The nature of the differences found suggests that it is possible to examine by means of test scores, rapport factors in interpersonal relationships.

3. By limiting the emotional impact of the examiner upon the patient, it should be possible to more adequately evaluate therapeutic agents.

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ON TEACHING PROJECTIVE TECHNIQUES IN AN ACADEMIC SETTING*

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I. Introduction

Because of the growing demand for courses in projective techniques that is arising in our graduate schools[12] and because the author feels that such courses pose problems different from those of teaching *either* Rorschach *or* the Thematic Apperception Test *or* any one test you please, this paper will deal with curricula designed to meet these academic demands. The author has thus far tabulated over 150 different "tests" that purport to diagnose personality, to which the adjective "projective" could properly be attached. For this reason the selection of a set of objectives for such a course will bear careful consideration. An important factor is the amount of time available in the university program. The Veterans Administration's Clinical Psychology Program has, among other things, set a virtual time limit on the number of years in which students of psychology expect to receive their Ph.D. degrees, and has also exerted an influence in the choice of courses. All of which results in severe cramping of time available for mastering the techniques with which this paper is dealing.

If one is limited to a one year course it should be entitled "Introduction to Projective Techniques" and it should be understood that the student must expect to continue his training in special schools or "workshops" after his four years in graduate academic training are completed if he expects to master any of these techniques. It is seriously doubted if any curricula in any graduate school in the country is at this date prepared for a three-year course, which the author feels is ideally suited to the production of psychologists trained to use projective techniques in a clinical situation. A two-year course is considered to be a practical compromise between an informative "Introduction to Projective Techniques" which can only alert the student psychologist to the field, and an "Advanced Practicum in Projective Techniques" producing a complete professionally trained "Graduate Projectionist." Before considering each of these three curricula it is necessary to point out several differences that exist between teaching these techniques in special courses (and workshops) and teaching these techniques in an academic setting.

The workshop technique was at first the only way to learn projective test methods because (a) there were only a few people who knew enough about them to properly indoctrinate a student, (b) these techniques had no academic status and had therefore to be taught extramurally, (c) the teachers were few in number, and (d) the projective techniques were also few in number. This system, it is felt, is now outdated because of the increased demand for training, the increased number of projective test techniques, and the dangers inherent in having a psychological test taught by a closely inbred group of specialists. It is felt that when a particular test technique is claimed as the exclusive property of a test in-bred clique, the vested interests of such a group may tend to predominate over their scientific integrity on either the conscious or unconscious level. These tests are then taught as if (a) all their problems of validity, reliability, and precision were settled issues, and (b) as if students can be qualified only through contacts with the original "master." The rightful place of any psychometric or psychodiagnostic device both for teaching purposes and for research purposes is in the more catholic atmosphere of the graduate schools of psychology; open to the inspection and surveillance of the experimental psychologists, who while not always friendly to such topics, can never-

* A brief part of this paper, under the same title, was presented at the September 1948 meeting of the APA.

theless supply valuable criticisms. The number of authors who have rushed into print with new psychodiagnostic devices untested in the clinic and unstandardized in the laboratory would have been materially decreased if these same people had to face daily a group of academic colleagues who would be more critical of these publications than are the editors of many of our publications. In that way, the whole structure of projective theory and philosophy would have been saved from a good deal of embarrassment in scientific circles.

II. The One-Year Curriculum

A. Objectives. The objectives of a one-year course in projective techniques should be limited to an informative presentation of material explaining projective theory and technique to students who want to be informed on the subject, but who will not be expected to master any of the techniques as a result of this course.

B. Prerequisites. For this course the prerequisites might well be courses in General Psychology, Abnormal Psychology, Experimental Psychology, Statistics, and Tests and Measurements.

C. Type of Student. This course could be given to first year graduate students and senior undergraduates with the necessary academic background. As a lecture and demonstration course no unusual limits would be imposed on the size of the class.

D. Pedagogical Techniques. Such a course could be primarily a lecture course with demonstrations by the teacher of each of the several principal projective methods.

E. Topics Covered. The curriculum outlined for this two semester course might run as follows:

First Semester

Week	*Topic*
1	Definition of Projective Techniques and Scope of Course
2	History of Projective Techniques
3	Psychology of Personality
4	Psychodynamics
5	Problems of assaying personality by non-projective methods
6	On Use of Symbolism
7	Organization and Classification of Projective Techniques
8	Problem of Test Scoring in Projective Techniques
9	Problem of Interpretation in Projective Techniques
10	Problem of Test Validity in Projective Techniques
11	Problem of Test Reliability in Projective Techniques
12	Problem of Test Precision in Projective Techniques
13	The Place of Experimental Evidence in Projective Techniques
14	Contributions to Projective Techniques from Analytic Schools
15	Contributions to Projective Techniques from Gestalt School
16	Review

Second Semester

Week	*Topic*
1	Rorschach Test: History and Administration
2	Rorschach Test: Scoring and Interpretation
3	Other Blot Tests
4	Thematic Apperception Test: History, Administration, and Interpretation
5	Szondi Test: History, Administration, Scoring, and Interpretation
6	Other Picture Type Tests
7	Autobiographies and Personal Documents
8	Expressive Movements: History, Myokinetic Psychodiagnosis
9	Expressive Movements: Play
10	Word Association Tests
11	Dream Analysis: History, Method, Interpretation
12	Graphology
13	Tautophone and Tactile Tests
14	Drawing and Graphic Art Tests
15	Miscellaneous Tests
16	Review

F. Case Material. Case material for demonstration purposes could come from the literature, as well as from the instructor's own case files.

G. Laboratory Work. The course is not conceived as a laboratory course. Classroom demonstration of the chief test forms is substituted in place of student work.

H. Texts. As of this date there is one book available: *Projective Techniques,* by John E. Bell, published by Longmans, Green & Co.[13].

II. Two-Year Curriculum

A. Objectives. The two-year curriculum is oriented toward the production of students with both a thorough background in the theory and scope of projective techniques and an intensive training in one or two of them sufficient to enable them to be of use in a clinical situation, together with a certain limited familiarity with several other types of tests. In addition, graduate schools can expect that this curriculum will become a focal point around which research projects will develop, not only for the staff involved but also for the graduate students, who are particularly interested in this field. This will result in a return of research work in the projective fields to the graduate schools.

B. Prerequisites. The prerequisites for this curriculum should be General Psychology, Abnormal Psychology, Psychodynamics, Experimental Psychology, Statistics, Tests and Measurements, and Personality.

C. Type of Student. The students should be second year graduate students of mature interest, stable personality, and of a creative imaginative mind, who are interested in training to become Clinical Psychologists. Because of the close supervision that it is advisable to maintain over the work of these students, it is recommended that the class size be limited to ten students for one instructor or fifteen students if the instructor is fortunate enough to have an assistant who is versed in projective techniques.

D. Pedagogical Techniques. This course should be conducted with both lecture and laboratory work. The first year should be taken up with the theories and principles of projective techniques in the lecture hours and with demonstration and practice in using the tests during the laboratory hours. In addition, individual conference time should be made available, which time should be spent in private coaching, with special emphasis on interpretation.

It is expected that in the second semester of this course the students will begin to concentrate on the one technique which they plan to master. At the beginning of the second year the student will pick up a second technique for intensive work along with continued practice and study of the test begun the previous year. Such a curriculum could be built around the following outline.

First Year (First Semester)

Week	*Topic*
1	Definition of topic and scope of course
2	History of Projective Techniques
3	Psychology of Personality
4	Psychodynamics
5	Problems in the Assaying of Personality by Non-Projective Methods
6	Problems in the Assaying of Personality by Projective Techniques
7	Basic Postulates in Projective Techniques
8	The Place of Symbolism in Projective Techniques
9	Organization and Classification of Projective Techniques
10	The Problem of Test Scoring in Projective Techniques
11	The Problem of Test Interpretation in Projective Techniques
12	The Problem of Validity in Projective Techniques
13	The Problem of Reliability in Projective Techniques
14	The Problem of Precision in Projective Techniques
15	Contributions to Projective Techniques from Analytic Schools
16	Contributions to Projective Techniques from the Gestalt School

First Year (Second Semester)

Week	*Topic*
1	The Place of Experimental Evidence in Projective Techniques
2	The Use of Ink Blots. Rorschach. Administration
3	The Use of Ink Blots. (a) Whipple; (b) Rorschach Administration
4	The Use of Ink Blots. (a) Stern; (b) Rorschach Scoring
5	The Use of Ink Blots. (a) Struve; (b) Rorschach Scoring
6	The Use of Pictures. Murray's Thematic Apperception Test
7	The Use of Pictures. (a) Rosenzweig; (b) Rorschach Work Continues—Scoring
8	The Use of Pictures. (a) M A P S; (b) Rorschach Work—Interpretation
9	The Use of Pictures. (a) Others; (b) Rorschach Interpretation
10-11	The Use of Graphic Art Forms*
12	The Use of Plastic Art Forms*
13-14	The Use of Expressive Movements*
15-16	The Dream Material*

* Continued work in administration, scoring and interpreting the Rorschach.

Second Year (First Semester)

Week	*Topic*
1	The Thematic Apperception Test: Administration
2	Rorschach Work with Children
3	The TAT Scoring
4	Rorschach Work with Children
5	The TAT Interpretation
6	Rorschach Work with Low IQ Subjects
7	The TAT Interpretation
8-9	The Rorschach Work with Neurotic Subjects
10-11	The TAT with Children
12-13	The TAT with Neurotics
14-16	The TAT with Psychotics

Second Year (Second Semester)

Week	*Topic*
1-2	Rorschach Standards with Children
3-4	Rorschach Standards with Psychotics
5	TAT Standards with Children
6	TAT Standards with Psychotics
7	TAT Standards with Neurotics
8-9	Sentence Completion Tests*
10-12	Dream Interpretation*
13-14	Expressive Movements*
15-16	Graphic Art Work*

* Continued work with Rorschach and TAT.

E. Texts. Textbook material for such a course is not available at this date. However, for such a course the teacher and student both have more time available than in the one-year course and the student can be expected to do more extensive journal readings. Further, there is also time to expect the student to make profitable use of a number of books now on the market that presume to provide instruction on the Rorschach test[4, 6, 7, 9, 11, 21]; the Murray Thematic Apperception test[15, 23, 26]; the Szondi test[25]; Dream analysis[10, 24]; Graphology[14, 18]; Drawing tests[2, 5, 8, 17]; Play techniques[3, 19]; and Sentence completion[20] as well as many others.

F. Auxiliary Readings. Again as in the textbook field more time can be devoted to a wider and more critical reading in the journal literature than was possible in the one-year curricula. There should be more stress placed on readings in experimental studies on test validity and reliability, and on theory and practice.

G. Case Material. Case work material for this course would come in part from the literature, in part from the instructor's files, and in part from actual cases provided by the instructor or procured by the student. Case material out of the literature enables the student to study the techniques of the "masters" in the field, the cases of his instructors will enable the student to relate theory and practice more intimately together as he sees it demonstrated by his instructor. It is recommended that each student be the "subject" or client, and take a projective test administered by the instructor for the pedagogical and therapeutic value such a procedure has for each student. This is an important step that should not be neglected. It will be necessary for the students and instructor to use whatever local resources are available in procuring subjects. If they are in the V. A. clinical program, they may have access to the patients of the V. A. Hospital. If the students are doing practicum work, or extern work in a hospital or institution, these agencies may be of help. In any event the use of friends or relatives as subjects should be discouraged.

H. Laboratory Work. The laboratory time should be spent in coaching students on the techniques of administering each of the several projective techniques. The students could very well administer these tests to each other, with the instructor present to criticize the technique and skill of the examiner.

III. The Three-Year Curriculum

A. Objectives. The three-year plan is a continuation of the two-year plan and results in the student acquiring greater proficiency in a larger number of tests. The third year should be an advanced course based upon two years of work in Projective Techniques as outlined above. It would also be the trial arena in which research in the projective field would be planned and executed.

B. Prerequisites and *C. Type of Students.* These factors would be the same as in the two-year course.

D. Pedagogical Technique. The best form for the third year would be a seminar type of course, where further skills and greater precision and surety could be developed in the students, and where special types could be studied. The topics

for the first two years would be the same as given above. The content of the third year might follow a pattern such as this:

Third Year (First Semester)

Week	*Topic*
1-2	Current Trends in Projective Techniques
3	Special Problems in Projective Techniques: Counseling
4	Special Problems in Projective Techniques: Personnel
5	Special Problems in Projective Techniques: Anthropological Studies
6	Special Problems in Projective Techniques: Schizophrenia
7	Special Problems in Projective Techniques: Criminology
8-16	Etc., etc., Together with Continued Work on Administration, Scoring, and Interpretation of Projective Tests under Supervision. Emphasis on Clinical Diagnosis

Third Year (Second Semester)

Topics

Research Plans of Class Members*
Experimental Design in Projective Techniques*
Test Construction in Projective Techniques*

E. Case Materials. It should be the responsibility of the instructor to so guide the student that his sampling of case materials is as diverse as possible. Concentration of attention on a limited clinical group or a limited age range, while desirable for the development of special skills should not be permitted to deprive the student of the opportunity which a college environment offers to sample widely. This chance may not come again to the same individual once he has become a busy clinician.

F. Laboratory Work. On this level, laboratory work would be experimental work on establishing validity, reliability, precision, introducing new test concepts, examining various interpretive criteria, setting up standards or norms for age or sex groups, and so on.

Summary

The teaching of Projective Techniques for psychodiagnosis, belongs in the curriculum of the graduate schools of psychology, rather than in private "workshops." The ideal curriculum for such a course would cover a three-year program. It is also possible to set up a one-year curriculum whose function it will be to introduce the student to the field of projective techniques but not attempt to train him to master any one procedure. Due to time restrictions, a two-year training program may be worked out as a compromise between a one- and a three-year training program. Sample curricula are developed for each of the above three programs.

* Continued work on administration, scoring, interpretation, and clinical diagnosis with each of the several techniques that the individual student is mastering.

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MENTAL GROWTH IN PSEUDO-FEEBLEMINDEDNESS

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INTRODUCTION

It has long been recognized that certain cases of apparent mental deficiency are, in reality, cases of delayed mental maturation. "Delayed maturation" is usually established *post hoc* since normal intellectual potentialities are seldom observed upon initial examination. These cases and others are subsumed under the diagnosis of pseudo-feeblemindedness.

Arthur[1], Bijou[2], Doll[4] and Neuer[10], have discussed the factors underlying pseudo-feeblemindedness. Since there is general agreement, the etiological features can be considered under the following: (1) sensory handicap, (2) educational deficit, (3) special intellectual disabilities (segmental organization), (4) speech retardation, (5) personality disorder, and (6) delayed maturation.

This paper will be concerned with cases of intellectual retardation which, by exclusion, are primarily attributable to delayed maturation. The principle of environmental under-stimulation as an important basis for delayed maturation has been extant in clinical thinking for sometime. This idea is implicit in the studies showing the importance of the environment in determining the IQ. The role of stimulation in mental development can be well illustrated by analogy. Just as the child who is bedfast from birth fails to develop in a normal physical fashion; so the child who is deprived of mental exercise fails to develop normal intellectual skills.

Actually, little is known about these cases of intellectual retardation. Since we are concerned with mental growth, comments on the principles of mental growth are relevant here. While many different curves of mental growth have been derived, they are in essential agreement about the point of intellectual maturation. Stated more exactly, the curve representing the regression of MA on CA reaches its maximum around the age of 20. It must be remembered that the mental growth curve merely represents the central tendencies of a sample population (usually a standardization group). These group data are often applied uncritically to individuals without regard for individual differences. Much of the literature presenting mental growth curves shows complete disregard for the variance of the population around those central tendencies. Since three mathematical parameters[(Gompertz curve, 9)] are necessary to describe mental growth adequately, the IQ alone will often prove an inadequate representation of an individual's mental growth. When the IQ of an individual is compared with the standardization group the implicit assumption is made that the growth curves are comparable in other respects, *i.e.*, other param-

eters are controlled. This assumption is often unjustified and a plot of the subject's growth curve would dispel any illusions as to IQ constancy.

In practical terms, maximum mental ability as well as the rate of approach to this maximum will describe post-infant mental growth. The age at which the maximum MA is reached may well prove a function of initial acceleration which probably is influenced by the degree of environmental stimulation[6]. Under-stimulation may tend to shift the curve along the MA axis in a positive direction and, in effect, the Y intercept is increased negatively for an assumed linear equation. It seems reasonable, however, to expect early under-stimulation to effect not only the rate of approach to maximum but also the maximum eventually reached.

Present Problem

The present study investigates the mental growth of individuals who have shown a marked increase in IQ. If the IQ increase of the individuals in the study can be explained by delayed mental maturation, growth should continue past the age of 20. The magnitude of IQ changes, a subject of perennial interest, and the mental growth curve are to be presented.

Method

Twenty-five patients of the Lincoln State School and Colony were the subjects in this study and constitute the experimental group. The individuals in this experimental group were selected from a list of patients who showed marked increases in IQs since their examination at the time of admission and are now in the Dull Normal or Normal range. Various revisions of the Binet and the Wechsler-Bellevue Intelligence Scale given by various examiners were used for IQ determinations throughout. Sixteen white males, three colored males, and six white females were included. Initial IQs of these patients ranged from 51 to 75 with a mean of 59 IQ points. Their ages at the time of admission ranged from 6.6 to 25.2 years with a mean of 14.3 years. The periods of institutionalization ranged from 2 to 27 years with a mean of 15.1 years. Twenty-five other patients served as a control group. Age and IQ upon admission, sex, final CA, and length of institutionalization were held constant between the groups by using the matched-pair design. The large number of factors controlled made it difficult to match subjects to the experimental group, as is so often the case with matched-pair experiments. However, in no case was there a significant difference between the means of the two groups for any of the factors matched. Individual differences between pairs were held to the 10% maximum, with few exceptions, as suggested by Peters and VanVoorhis[11].

Before the IQ changes were evaluated, the Wechsler-Bellevue IQs were equated with the Revised Stanford-Binet IQs. This was necessary because Wechsler retesting was more frequent in the experimental group. An unpublished study by the writer showed Wechsler-Bellevue EQs[13] to be 5.33 points higher than the Binet IQs for a population similar to the one used in the present study. The t-test of that difference was significant at the .01 percent level of confidence. Accordingly, all Wechsler-Bellevue IQs were converted to EQs and after five points had been deducted, the results were considered equivalent to the Stanford-Binet IQs.

Comparability of IQs between test-retest was investigated further. Some difference between the revisions in the Binet was noted in this longitudinal study. Four cases in the experimental group had a final, 1937 Revised Binet compared with the initial, 1916 Binet. According to a study by Glick, Flynn, and Macomber[5], this would artificially raise the IQ of the experimental group about four points for each. This would constitute a mean error of .64 points for the IQ increase of the experimental group. The correction was so small that it was not made in the data presented. The only other discrepancies in tests were the use of the Herring-Binet vs. the 1937 Stanford-Binet for one case, and the 1911 Binet vs. the 1916 Binet for another.

Results

The experimental group showed Binet-equivalent IQ increases, since admission, that ranged from 6 to 43 points with a mean of 23.7 points. Individuals in the control group, who were selected without regard for IQ changes, showed changes ranging from a loss of 38 points to a gain of 13 points with a mean algebraic increase of only 3.2 IQ points. In Figure 1, which shows the regression of MA's on CA's, the divergence of the two groups is obvious. The experimental group shows a rather constant, low, negative acceleration throughout the whole CA range. It should be noted that deceleration even in the late 20 CA range is not appreciable. The t-test between the last two points of the curve in Figure 1 for the experimental group is significant at the .1% level of confidence. In no individual case did the data indicate that mental growth had ceased on or before the age of 16, as assumed in the calculation of the Stanford-Binet IQ. In contrast to this, the mental growth curve for the control group shows a higher deceleration throughout. The maximum is approached near the age of 20 and no appreciable increase in MA occurs after that time.

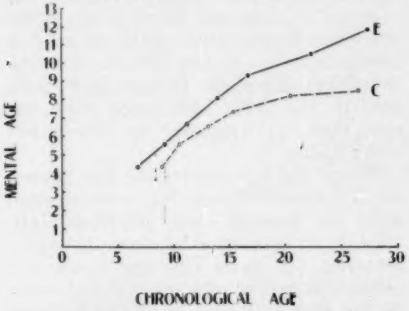

Fig. 1. Showing mental growth curves for the experimental (solid lines) and the control (dotted) groups.

Figure 2, presenting CA vs. percent maximum MA, demonstrates the correspondingly greater CA of the experimental group required for given levels of mental maturation. The differences in acceleration between the two groups in Figure 1 is represented by the progressive divergence of these curves from one another.

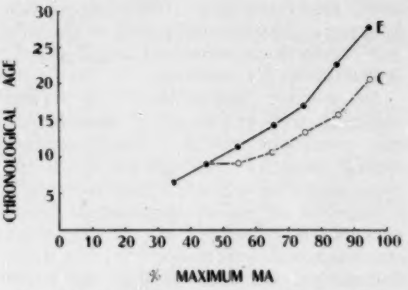

Fig. 2. Showing the ages when different levels of intellectual maturation have been reached. The experimental group is represented by solid lines and the control by dotted.

A t-test of the difference in CAs between the groups when maturity is reached (95% of the maximum MA) is significant at the .1% level of confidence.

Discussion

The IQ is a theoretical construct which was designed to remain constant. Small variations in the IQs of an individual are expected because of errors in measurement, differences in examiners, the application of different tests, and slight differences in mental growth rates. When rather large variations in IQ are observed, they often can be explained by special factors operating in the individual cases. The increases in IQ seen in this study are so marked that they cannot be explained by any of the usual artifacts. Furthermore, special factors such as segmental organization of abilities, delayed speech, sensory handicap, and educational deficit did not seem to play an important role in the etiology of the mental retardation of the subjects in this study.

The results of this study indicate a statistically significant difference between the mathematical parameters of the mental growth curves of the experimental and control groups. While the curve for the control group conforms to that expected for feebleminded subjects, that of the experimental group is significantly at variance with this. Certain implications

follow from the observed differences in mathematical parameters of the two curves. The IQs for both groups represent the rate of mental growth during childhood. Furthermore, the IQ for the controls implicitly gives the maximum mental level to be reached in adulthood. With the experimental subjects, inferences about the maximum level to be reached cannot be made. This is a consequence of applying the MA units derived from a population reaching its maximum mental growth at 16 to those who really reach the maximum after 27. Such application of the MA scale is misleading.

The IQs corresponding to the MA data are fairly constant until the age of 15. After the CA of 15, the IQ for the experimental group increases at an even rate through the CA of 27.5. On the Wechsler-Bellevue, corrections are made for deterioration after the CA of 24. While such corrections would be applicable to the control group, they would artificially raise the IQs in the experimental group, since empirically determined mental growth is still continuing.

The orientation of this paper is primarily theoretical. It is unfortunate that no practical suggestions can be made to facilitate the clinical description of the mental ability of these individuals. It is concluded that cross-sectional study of mental ability cannot provide an adequate indication of the acceleration of the mental growth curve, which seems to be the differentiating factor. No relationship was observed between behavior or personality problems and post-adolescent mental growth in this investigation. Personality disturbances might have had a slight influence on a few cases, but indications were generally absent among the experimental subjects. It is interesting that a good clinician utilizing a dynamic psychopathological approach was less able to differentiate between the two groups used in this investigation, than three other, more naive judges. His hypotheses regarding the lowering of mental ability through the operation of emotional factors and sensory disabilities did not appear to be useful in recognizing those cases which showed marked gains in IQ.

Summary and Conclusions

1. Twenty-five patients of the Lincoln State School and Colony who showed marked increases in IQ and are now classified as having dull normal or higher intelligence were compared with a control group by utilizing the matched-pair design.

2. The mean increase in Binet-Equivalent IQ's for the experimental group was 23.7 points as compared with 3.2 points for the control group.

3. Lower deceleration of the mental growth curve for the experimental group is apparent. Thus, appreciable mental growth occurred well past the age of 20, and was still continuing at the age of 27.3.

4. While the IQ seemed to represent the mental growth characteristics of the feebleminded, it failed to demonstrate adequately the characteristics of mental growth of the pseudo-feebleminded group.

5. The results of this investigation suggest that some cases of apparent feeblemindedness are a consequence of delayed mental growth. When cases show marked IQ increases after adolescence, delayed mental growth should be considered as a possible explanation.

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CLINICAL NOTES

PROJECTIVE TECHNIQUES AS PSYCHOTHERAPY

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INTRODUCTION

Not many years ago, in an army hospital, one clinical psychologist said to another: "I can't understand it; I've given that patient three Rorschachs—and he's no better!" At that time this seemed not without humor, as Rorschach's test[12] was conceived largely as a diagnostic instrument, and it was common knowledge that one did not cure patients merely by diagnosing their disorder. More recently, however, there seem to be indications that Rorschach's test and other methods of psychological analysis are no longer considered as simply diagnostic, but rather as an integral part of the therapeutic process[3, 4, 5]. However, analysis of the pertinent literature suggests that the various techniques are never employed deliberately *as therapy;* therapeutic results —such as catharsis and establishing better rapport—are gratefully received by-products. The appearance of such therapeutic results is accordingly indeterminate, and is not subject to systematic, scientific control.

The present paper offers the suggestion that *certain of the so-called "projective tests" may be employed in such a manner that their use will have a distinct psychotherapeutic effect. This psychotherapeutic effect is to be considered as the primary purpose for which the particular projective technique is to be used;* the relative value of this particular form of therapy, as contrasted with such extant approaches as psychoanalysis, non-directive counseling, etc., can only be determined empirically.

THE PROPOSAL

The suggested type of therapy is to be known as *perceptsynthesis.* The therapeutic goal is the modification of the manner in which the client perceives his environment. The desirability of achieving such a goal is based on the assumption that maladjusted behavior is related in large measure to deviant modes of perception.

Rationale. While this condition does not seem to be requisite for the physiological reflex, all *psychological* behavior must be based on perception. It has not been demonstrated that psychological science can as yet adequately predict, much less control, the *behavior* of the individual human organism. There is, however, considerable evidence that the manner in which an individual *perceives* his environment may be experimentally modified[1, 2, 7, 10, 11]. While the extent to which experimentally induced modifications in an individual's mode of perception will be *acted upon* in his daily life is not known, it appears obvious that this will be a function of the permanence of the induced modifications. "Permanence," or the *strength* of the modifications, will, in turn, obviously be acquired in accordance with laws of learning, and will depend on such variables as: strength of

drive (or amount of deprivation), number of repetitions, and probably on some principle of effect, need-reduction, or satisfaction.

It is not necessary to cite evidence for the statement that psychological behavior must be based on perception. The point is not at issue here whether it is an elemental physical stimulus, a Gestalt, or an expectation that is perceived; it is sufficient for the present argument to say that a psychological act is temporally preceded by a related percept which, in an undefined way, rendered probable (at a certain level of confidence) that particular act, or,

$$R = f({}_{s}P_{r}) \quad . \qquad (1)$$

where ${}_{s}P_{r}$ is the percept, anchored in both stimulus and response, and R is the predicted act.

The nature of a percept, of course, can be known only in terms of how it is reported, or in what way an objective stimulus is acted upon. The percept itself, then, may be effectively ignored, and

$$P \equiv s.r \quad . \qquad (2)$$

Accordingly, *perceptsynthesis* may be said to be based on the further assumption that modification of responses or patterns of response to objective stimuli will result in modification of those acts or patterns of behavior known to be significantly correlated with those responses. This is true since s is held experimentally constant and, essentially,

$$R = f(r) \quad . \qquad (3)$$

Let us consider, then, Rorschach's test. The objective stimuli are essentially ten inkblots plus a set of instructions. Responses are obtained and analyzed according to one or more of several systems, and a "personality picture" is drawn. This picture is actually a set of predictions, in more or less general terms, about the future behavior of the client. On retest, after an intervening period, if the responses have been modified to any extent, the "personality picture" is modified, and another set of predictions is made, and

$$R_n = f(r_n) \quad . \qquad (4)$$

Rorschach's technique is widely held to be a valid prognostic tool. If it can be demonstrated that, through the repeated use of Rorschach's test (in a manner to be described below), the patterns of responses can be reliably modified in a "desirable" direction, we would then have an equally valid therapeutic agent.

Procedure. Session 1. Rorschach's test is administered in the usual manner. "Testing the limits" is done in the manner of Klopfer[6]. The concept of "limits" is of critical importance in determining the outcome of therapy. Clearly, a client's mode of perception may not be modified beyond his "limits," which serve, literally, as the limiting factor in therapy. The responses are then analyzed in the usual manner. Two personality pictures must then be drawn. The first of these represents the client as he appears at the time of testing—the analysis of his scorable responses. The second picture represents the "ideal" personality structure *of the client,* and is based on material gleaned from "additionals" and from testing the limits. The *difference* between these two pictures is then determined. This *personal error* represents the difference between the client's present mode of perception and his *potential mode* of perception, rather than some *a priori* "ideal" or "normal" mode of perception.

Session 2. Rorschach's test is again administered. Verbal statements to and conversation with the client are only of such a nature as the therapist deems necessary to encourage him to retake the test. The *test procedure* is the *therapy,* and the therapist does not concern himself with the verbalizations of the client except insofar as they affect the test administration.

One variation in the test procedure is here introduced: the therapist *reinforces,* verbally or by some other symbolic means, such as facial expression (the test being this time administered "across the table") those responses which are "desirable" and *negatively reinforces* by similar means those responses which are "undesirable;" this is the crux of the procedure.

The number of additional sessions required is dependent, of course, on the speed with which the client learns to modify his perceptions or re-perceive his

world. This will depend on the size and nature of his "personal error" as well as on the prestige or need-reducing qualities of the therapist, which will determine the intensity of the reinforcement.

Discussion

The obvious objection to *perceptsynthesis* is that "you cannot change a person's behavior merely by inducing him to change his test responses." This objection is based on a misconception. If Rorschach's technique is a *valid test*, it must be true that Rorschach responses *correlate highly* with behavior in a certain criterion situation. There is, of course, no implication as to causality; this correlation is simply interpreted as the *probability of mutual occurrence* of two sets of events, namely, behavior on the Rorschach and behavior in the validating situation. The greater the validity of the test, the more perfect is this correlation, and the greater the tendency for one set of events to vary directly as a function of the other.

It would be possible to speculate at this point on the existence of some central perceptive mechanism which controls both test responses and those tendencies to behave which are correlated with test responses. However I believe that at this time the positing of such a mechanism would be entirely gratuitous. The probability of mutual occurrence, *per se*, in the absence of any set temporal or spatial relationships between the events should be sufficient to indicate that modification of one set of events will produce modification of its correlates.

There are a number of conditions which might invalidate the proposed form of therapy:

1. The correlation between Rorschach responses and tendencies to behave may not be sufficiently high. This situation could be met by increasing the battery through adding other projective techniques, such as the TAT[9], thus increasing the predictive value and the correlation with behavior.

2. Both Rorschach's test and the TAT afford stimuli to and induce responses from only a limited number of sensory and reactive modalities. Introduction of other techniques, as the Tautophone[13] and the Mira Myokinetic technique[8] would add the auditory and kinesthetic modalities respectively. Tactile techniques might also be employed.

3. It is conceivable that the client may not wish to cooperate in a procedure which apparently merely requires him repeatedly to take the same test or tests. The task of maintaining the interest of the client is, in any case, the function of the therapist.

It is possible to keep a simple and relatively objective record of the induced changes in test responses. Independent judges would then be in a position to compare changes in the general behavior of the client with changes in test responses, and thus evaluate perceptsynthesis as a technique. Perceptsynthesis is a straightforward psychological technique with a theory based on scientific psychological principles.

Summary

A psychotherapeutic technique based on the modification of the client's modes of perception has been described and related to psychological theory.

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A NOTE ON SCORING WECHSLER-BELLEVUE SUBTESTS

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TABLE 1. *Combined scoring table for picture arrangement*

Series	*Order*	*Credits* 6	5	4	3	2	1
House	PAT	....	....	....	.....	1-60*	....
Holdup	ABCD	....	....	....	.....		....
Elevator	LMNO	....	....	....	.....		....
Flirt	JANET	....	....	....	1-120	.....	....
	JNAET	....	....	....		.....	....
	AJNET	....	....	....	.....	1-120	....
Fish	EFGHIJ	1-20	21-30	31-40	41-120	.....	....
	EFHGIJ	....	1-20	21-30	31-40	41-120	....
	EGFHIJ	....	....	....	.....	.....	1-120
	EFGIHJ	....	....	....	.....	.....	
Taxi	SAMUEL	1-20	21-30	31-40	41-120	.....	....
	SAMEUL	....	1-20	21-30	31-40	41-120	....
	SALEUM	....	....	....	.....	.....	1-120
	SALMEU	....	....	....	.....	.....	
	SALMUE	....	....	....	.....	.....	
	SALUEM	....	....	....	.....	.....	

* Time in seconds.

Some of the subtests on the Wechsler-Bellevue Intelligence Scale, *e.g.*, Arithmetic, Picture Arrangement, Block Design, and Object Assembly require the addition of "time credit" to the regular "accuracy credit" for many of the items. As the tables are given separately in the book(1) and in the manual(2) for the time and for the accuracy scoring, it is necessary to look up scores on two tables and perform an addition to obtain the final scoring credit. This introduces a source of error since the addition may either be overlooked or incorrectly performed.

1. WECHSLER, D. *The measurement of adult intelligence.* Baltimore: Williams & Wilkins, 1944 (3rd ed.).
2. WECHSLER, D. *The Wechsler-Bellevue Intelligence Scale.* New York: Psychological Corp., 1946.

In order to reduce the chance of errors of this nature the accuracy and time tables may be combined into one table so that the final scoring credit is read off directly without the necessity of any extra manipulation. Such tables are also easier to use and time will be saved by

TABLE 2. *Combined scoring table for block design*

Design	*Credits* 6	5	4	3
1, 2, 3	1-5*	6-10	11-15	16-75
4	1-10	11-15	16-25	26-75
5	1-25	26-35	36-50	51-150
6	1-40	41-50	51-80	81-150
7	1-80	81-100	101-140	141-195

* Time in seconds.

their adoption. Examples of the combined tables are presented below for Picture Arrangement (Table 1) and for Block Design (Table 2) for Form I. Similar tables can easily be constructed for the other subtests and for Form II.

AN ANALYSIS OF THE COMPARATIVE EVALUATION OF ALLEN'S BRAIN INJURED PATIENTS AND OF NORMAL SUBJECTS

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Prior to publication of their article in this Journal, Blake and McCarty[3] submitted the original manuscript to the writer for suggestions. The final paper shows an appreciation for some of the writer's comments in his letter of reply, but the basic points seem to have been slighted. At that time the writer commented as follows: "I believe that an understanding of why I wrote my 'Note'[1] is necessary. I felt that Levi, Oppenheim and Wechsler[4] were making too wide claims for the *differentiating value* of their M.D.I. as between mentally ill and brain injured. I did not consider normals for my sampling population because it was a matter of merely commenting on their claims for the differential diagnostic value as between *ill persons*. . . ."

In this letter to Blake and McCarty, the writer also discussed the two study groups. In his original study[2] the writer used 50 brain injured veterans as subjects with average IQ of *94.98*, age range from 20 to 55 years, and education that spanned from the fifth grade to one year of college, the average accomplishment being two years of high school. As against this group, Blake and McCarty used "normal" college students with mean IQ of *124.8*, average age 25 years (range not given), and school achievement presumably at the college level. These differences led writer to state: "There is a possibility of a population-matching error. IQ differences average 30 points and age differences are 3 years, 3 months between the groups. My population came from all walks of life. . . . The high average IQ of your group of normals would seem to suggest a selected group . . . . with a rather narrow age range. This would affect the subtest scores and perhaps render questionable a direct comparison."

Another factor should be considered in reading Blake and McCarty's article. They state in part, ". . . . the distribution of M.D.I's is corrected for ages and because it is believed to be independent of mental level (an assumption which needs verification and one which is currently under investigation), ..." [3, p. 415]. The writer is still unwilling to grant this non-validated assumption and stated as much in the letter: "Your assumption of independence of the M.D.I. from mental level is questionable. . . . I believe further research is necessary before any position may be taken on this matter. If I grant you this premise, then I have no right to go further in this analysis (of the original manuscript)." Yet Blake and McCarty assume an hypothesis, reify it and draw a conclusion.

Before closing the letter to the joint authors, the writer repeated his admonition in order to emphasize their misconstruction of the "Note." "Again my only comment is that you are comparing normals with brain injured, while I (in my "Note") was questioning the differential efficiency of the M.D.I. *between brain injured and mentally ill patients*. You are probing in a different area. Actually it appears you have an altogether different problem (the answer to which is important), but the application of your findings do not seem to be appropriate to my comment on Levi, Oppenheim and Wechsler's contention in their article.

Wechsler's M.D.I. concept as contained in his book is not at all in question, now or at any time. It is its narrow application to *differential diagnosis between types of illness* (purely psychogenic and organic) that seems to be the area of disagreement, and not its value in discriminating between normals and "abnormals." My "Note" questioned only the desirability of using Wechsler's list of Hold and Do Not Hold items. More specifically, I question the desirability of including the Object Assembly in the Hold list while using this index formula with brain injured. My results have shown that OA does not hold up at all age levels with the encephalopathic."

The writer believes that Blake and McCarty have twice erred in their article:

(a) by comparing their apples with the author's oranges, finding nothing in common between the two, and so rejecting the reality of oranges because they do not fit the description of apples, and

(b) by misunderstanding the basic contention of Levi, Oppenheim, and Wechsler's use of the M.D.I. as a device for differentiating between psychological and organic illness.

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A NOTE ON HYPNOTIC TECHNIQUE

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A minor mishap resulting from an unauthorized experiment with hypnosis indicates a possible precaution to be observed in awakening subjects from the hypnotic trance. A student hypnotized his wife to conduct a standard experiment in the production of tactual hyperesthesia. Although he succeeded in awakening her she was completely mute. They were both considerably disturbed and called the writer for help. The subject was found to be completely oriented and capable of communicating by writing. She complained of feeling slightly light-headed and described what appeared to be a tonic contraction in and around the throat which did not, however, interfere with swallowing, breathing or coughing but apparently kept her from making any sounds or even moving the lips in normal speech movements.

Upon questioning the experimenter it appeared that all his procedures had been those commonly employed in hypnotic experiments including the instructions to awaken by having the subject count to ten in unison with the experimenter. His wife was found to be able to move her arm any desired number of times indicating complete orientation as far as number series were concerned. In one written message she complained, however, that "seven is the worst number to try and get out. It gets stuck." In about an hour speech was partially restored by relaxation procedures and casual suggestions. After a night's sleep the subject was completely normal and regarded the experience as something of a lark.

In trying to discover the reasons for the temporary mutism, the subject on the following day suddenly remembered that she had had pentathol administered intravenously several months before for minor surgery. The anesthetist had followed the standard procedure of having her

count aloud while the drug was being injected in order to gauge the depth of anesthesia. She remembered that she had struggled to count past the number "six" and had been unable to pronounce the "seven." This recall plus her previous written message about getting "stuck" on seven seems to provide at least a partial explanation for her mutism. The facts suggest that the counting served as a stimulus for two very conflicting responses both of which involved a change in consciousness. In the one situation (pentathol anesthesia) counting resulted in a loss of consciousness. In the other situation, counting was supposed to result in arousal from the trance.

It well may be that the unknown factors entering into all such occurrences would be unlikely to be repeated in other experiments with hypnosis. Nonetheless, in view of the need to avoid the arousal of the usual superstitious accusations following each minor mishap with hypnosis, experimenters might wish to avoid the counting technique in awakening subjects from the trance. Pentathol seems to be used more and more widely for very brief anesthesia and the counting procedure is standard technique. It would be interesting to know whether other experimenters or therapists using hypnosis have encountered similar difficulties where prior pentathol anesthesia has been involved.

A SIMPLE SCORING DEVICE FOR QUANTIFYING GRAPHIC PRODUCTIONS

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In the course of standardization of a new Graphomotor Projection Technique, the authors devised a simple method for partially quantifying graphic productions. It is here described in the belief that it can be applied to other graphic methods of personality appraisal.

The protocols of the Gehl-Kutash Test are obtained on 8 x 10½ sheets of unlined white paper and consist of structured and unstructured material covering varying areas of the paper with differing degrees of density. For example, in some protocols a large portion of the page is filled with what is commonly known as "scribbling." In other records only a small portion of the page is filled in the same five minutes with "scribbling." In still other records structured productions are present such as pictures, letters, words, numbers, form designs, and geometrical figures. Some records have combinations of scribbling and some type of structured material.

The scorer is an 8 x 10½ piece of clear and colorless celluloid which is divided into 64 equal boxes by red lines. This scorer is placed over the 8 x 10½ sheet of white paper on which the graphic production has been produced. This immediately makes it possible for the protocol to be analyzed in small units. In the Gehl-Kutash test these units are scored for density and/or quality of production. By density the authors mean the number of unidirectional lines per box which are scored on a rating scale from A to E in order of increasing density. By quality is meant the type of structuring which is scored by a letter designation for each particular type of structuring such as P for pictures, G for geometrical figures, etc. A sample scored record might have the designation of 52A, 2P, 1G. This would mean 52 boxes in which scribbling occurs with only a few lines per box (A density), plus 2 boxes with pictures and 1 with a geometrical design.

The celluloid scorer device can be applied to handwriting samples to determine

the relative size of different samples of handwriting as well as the number of letters per unit area. In figure drawing it can be used to determine the relative amount of space filled in relation to the size of the paper and the relative amounts of space filled by the head, limbs, body, etc. Thus a large head would fill a relatively higher percentage of boxes when considered in relation to the total amount of space filled by the entire figure. In other tests it might be necessary to increase or decrease the total number of boxes on the scorer to suit special purposes.

EDITORIAL OPINION

The changes which have come about in the practice of clinical psychology, and the directions of its expansion, as a result of wartime and postwar demands are not an unmixed good. In the slower, but notable, growth of clinical psychology in the decade before the war, the function of the psychologist in relation to other professions was becoming clearer. While children's problems appeared to occupy the attention of most clinical psychologists, there was an increasing recognition of their place in dealing with adults. Much, if not most, of the efforts of psychologists were being devoted to work outside of mental or other institutions. Community child and adult clinics, school systems, social agencies, and other community oriented activities commanded major attention. At the present time it appears that the emphasis is strongly on institutional work. While the plans of the Veterans Administration envisage extramural mental hygiene clinics it appears that the major emphasis is being placed on the demands of mental hospitals. The extremely valuable support of the Veterans Administration for the training of clinical psychologists has in fact set a pattern in the direction of training for institutional work, whether or not there has been intention to do so.

While the importance of work with patients in institutions cannot be denied, this may be thought of as a particular specialty. As such, training for the specialty may produce an undesirable narrowing of the training of clinical psychologists. Graduate departments in Universities should carefully study their training programs and especially their facilities for internships. Exclusive or major dependence upon mental institutions for such internships appears highly undesirable. In almost all institutions extramural internships in campus guidance centers or community agencies are, and should be, made available. It seems a reasonable argument that work with patients in institutions is corrective only and, while valuable, has limited social significance. On the other hand, work in community oriented agencies has primarily preventive value and so is of greatest importance in terms of improved mental health in society. Psychologists must recognize, and be prepared to assume, their responsibilities in the improvement of the mental health of the community, as well as in the diagnosis and correction of behavior deviations of individuals.

C. M. L.

One of the most disturbing developments in modern psychology has been the trend toward the establishment of separate university departments for the development of psychology as pure science and as applied science. Thus, in several of the larger universities, pure and applied psychology have been established in separated departments with different staffs, student bodies, curricula and basic theoretical orientations. After reviewing the published justifications which have appeared in defense of such a state of affairs, the conclusion seems inescapable that the fission represents a political compromise between two factions each

unwilling or unable to take the larger viewpoint of regarding psychology more comprehensively as a basic unity. It has been argued that psychology should be taught as pure science under the graduate Faculty of Pure Science, and as applied science in the professional schools. This situation is justified on the grounds that there is a similar division of duties in other departments of the university. In our opinion, such a viewpoint cannot be castigated too severely. Just because other departments are hopelessly and irrationally divided with resultant diffusion and dissipation of resources is no logical reason why psychology should embark upon a similar course. If carried to extremes, as has occurred in one great American university where it has been necessary to establish a committee to administer and integrate the activities of psychologists functioning autonomously in several different departments because it was impossible for all concerned to agree upon a single departmental chairman, psychology may deteriorate into a welter of conflicting political and theoretical ideologies which can bring nothing but discredit upon the profession locally and nationally. The inconsistency of the situation is illustrated by the Harvard report on *The Place of Psychology in an Ideal University* which presents some very sound conclusions but in the foreword of which President Conant was forced to note that the actual plan of reorganization at Harvard was in some respects conflicting with the major conclusions of the report. One is forced to the conclusion that the fission of psychology at Harvard represented an expedient compromise between conflicting interests and personalities rather than a logical and internally consistent solution.

The conflict between the interests of pure and applied psychology will not be effectually resolved until the universities assume some responsibility for grappling with the problems involved and coming up with some workable solution which will provide our science with the facilities and resources which it needs. The prime need is for some truly great leaders among academic psychologists who will be big enough to secure for psychology the place that it deserves in university organization and to integrate the various conflicting interests in a unified program. In order to accomplish this, there may be need for the universities to revise certain basic statutes and policies. It is interesting to note that a harmonious working relationship between the basic and clinical sciences has been achieved in medical education in which both groups are integrated in one faculty. We understand that preexisting patterns of university organization in many cases present almost insurmountable obstacles to the integration and unification of all psychological services. In our opinion, the present unsatisfactory status is not inevitable but could be modified through the intelligent study and cooperation of all interests concerned. It seems desirable to emphasize strongly the difference between the teaching and research obligations of a university department. The teaching orientation should be genuinely comprehensive and eclectic with proper emphasis on all relevant developments in the science. All students should be uniformly exposed to a comprehensive curriculum overweighting neither pure nor applied interests. It is *undesirable* to allow research interests to determine the orientation of the teaching program. While it may be desirable to integrate departmental research facilities in a program of research in either pure or applied areas, it is not desirable to limit the teaching orientation according to the pattern of research interest. *We strongly question whether any department can establish itself as being solely dedicated to pure science.* Most students do not have the perspective to judge what their ultimate field of specialization will be, and this decision should be left for postgraduate years. Nor can any department choose only those candidates who will become good researchers. Too frequently, interests change so rapidly that the only solid foundation is a genuinely eclectic one.

In many psychology departments it has been considered part of academic freedom to permit members of the teaching staff to teach psychology from any systematic viewpoint. The situation is comparable to that of freedom of religion

in which a person is permitted to subscribe to any "faith" which he desires to. In order to expose the student to a representative sample of systems, many departments have deliberately gone out seeking to secure teaching personnel known to represent various viewpoints. Thus one commonly finds Behaviorists, Gestalt psychologists, psychoanalysts, nondirectivists, animal psychologists, experimentalists and a variety of other "specialists" whose viewpoints are so conflicting as to leave the student in confusion as to what psychology actually is. In fact, the analogy with freedom of religion seems quite appropriate in a situation where the beginning student must choose his own systematic affiliation in much the same manner as if he was choosing a faith. The total result of this disorganized state of affairs has been to lower the scientific prestige of psychology which is many things in different places. Not only is the student bewildered and confused by the conflicting ideologies encountered within a department, but the general public and other professions are led to the conclusion that such a confusion of systematic viewpoints can only indicate that psychology is not science. There is great need for a standardization of viewpoints not only within departments but throughout the science as a whole. In medicine, education is so thoroughly based on solid science that viewpoints and curricula are almost identical throughout the world. We need to take time to fit all established data into one internally consistent system which would relate all known facts. After all, there can only be one absolute truth. Not all the conflicting viewpoints can be valid, and instead of perpetuating sects and cults, there is need for widespread acceptance of a genuinely eclectic viewpoint. After all, science can never be a matter of faith and instead of magnifying the apparent discrepancies between systematic viewpoints, it would seem more valid to attempt to integrate them for whatever truth may be contained in each viewpoint. Psychology will only become a true science when denominationalism is abandoned.

Unfortunately, the best interests of the student have frequently been lost sight of in the ideological confusion which has so characterized American academic psychology. Confronted by a babel of inconsistent systematic viewpoints and applied schools, the situation is further complicated by the necessity of deciding whether to become a pure or applied psychologist. If he studies with a "pure" faculty, he finds himself incompletely prepared for the clinical interests which he may later develop. If he studies with the "applied" faculty, he may find that his background in the basic sciences is weak. Similar comments are applicable to departments which are heavily weighted in the direction of any school. The student who has been taught only nondirective methods may later develop considerable anxiety when he finds himself inadequately prepared in other techniques which competitors are using. The inescapable conclusion is that the best interests of the student are served only by a genuinely unified and eclectic academic orientation which integrates all that is established scientific fact into an internally consistent system.

F. C. T.

LETTERS TO THE EDITOR

To the Editor:

Writers of texts, monographs, and articles frequently must spend an enormous amount of time and energy, often futilely, in the effort to adhere to a uniform pattern of supplying bibliographic details for the publications they cite or list month, year, volume, pagination, and one given name of the author in order to indicate the sex. The assumption is readily

made, especially by graduate students in oral reports or in terms papers, that all writers are males who reveal only the initials of their given names. This leads to embarrassment when later it is discovered that "A. B." referred to as "he" or "his" is a woman and not a man. I have on numerous occasions found it necessary to correct such blunders due purely to the practice of some writers of concealing their sex behind sexless symbols. To remedy this obvious omission, it is suggested that editors and publishers require one given name of all authors and that bibliographies publish at least one given name of all cooperating authors, and not merely of the writer whose name comes first. Reprints should contain the name of the Journal, the year, month, volume, and original paging. Some publications still alter the paging and omit the month. Publishers of book catalogues would make a contribution if they would supply the full name and the date of at least the latest edition, as is done by some medical publishers (*e.g.*, W. B. Saunders Company).

On the current issue of the requirements for membership in the A. P. A., I am in favor of the retention of the present provisions for members, fellows, and associates. No one should, in my judgment, be elected as a member who does not hold a Ph.D. from a reputable university (I have some scruples about the cheapened surrogate, the D.Ed.). No one should be advanced to the status of fellow who has not made distinguished contributions after receiving the Ph.D., and no one should be officially recognized as a "psychologist" who cannot qualify as a member or fellow. The title of psychologist should be as jealously guarded by psychologists as is the designation of physician by physicians. No one would lay claim to the title of physician or allow himself to be so designated, who does not possess the M.D. degree. In view of the swarm of mountebanks infesting the field of applied psychology, let us make the name "psychologist" mean something. Since the early days of Binet testing, hundreds of testers have been officially listed as psychologists although some have not even held a bachelor's degree, while many have not advanced beyond the baccalaureate or have just emerged from a year of graduate instruction.

In saying all this, I am, nevertheless, equally clear that anyone who holds a master's degree conferred in course by a reputable university for work in psychology should be eligible as an associate in the A. P. A. In applied psychology, as in medicine, many levels of service exist that can be satisfactorily performed by competent technicians who need not be Ph.D.'s or M.D.'s. In the area in which I have functioned since the first decade of the century there is just as much need for competent psychoeducational examiners or psychometrists as there is need for efficient nurses in the field of medicine. Candidates with master's status who have the needed training and experience can do the work of a psychometrist, which must be done, as well as most clinical psychologists, and much better than some clinical psychologists I have known. Moreover, many clinical psychologists would not be satisfied to spend their lives testing. I spent the major part of ten and a half years in the routine administration of psychoclinical tests after nine years of teaching and research. How many topflight clinical psychologists will become reconciled to devoting their time, day in and day out, to the routine testing of the never ending horde of referrals that are shuttled into public psychological clinics?

J. E. WALLACE WALLIN,
Lyndalia, Delaware.

BOOK REVIEWS

WATSON, ROBERT I. *Readings in the Clinical Method in Psychology.* New York: Harper, 1949, pp. 740. $4.50.

This is a collection of over 50 of the most significant papers of the recent literature relating to all aspects of the clinical method in psychology. The author is to be commended for his astuteness in making a genuinely eclectic presentation of the most significant contributions in the field. Part one consists of six papers discussing the nature of the clinical method as applied to clinical psychology. Part two includes nine papers describing the functions of clinical psychologists in a variety of different installations. Part three on diagnosis in clinical psychology includes 19 papers discussing all of the principal methods authoritatively. Part four consists of 19 papers presenting modern methods of counseling and psychotherapy. The general orientation of the book is distinctively psychological in the sense that the contributors are all psychologists rather than psychiatrists or psychoanalysts. To be recommended as the most comprehensive teaching and reference text in the field today.

ANDREWS, T. G. (Ed.) *Methods of Psychology.* New York: Wiley, 1948, pp. 716. $5.00.

This is a compilation of 22 papers by distinguished American psychologists describing the *standard methodology* available in the principal areas of psychological research. The emphasis is on the nature of the methods rather than on the results of investigations using the methods. Clinical psychologists will be particularly interested in the sections on conditioning and learning; memory and transfer; human thinking; perceptual phenomena; motivation, feeling and emotion; neuropsychology and bodily functions; appraising intelligence and other aptitudes; personality appraisal; methods of clinical psychology; studies of disordered persons; studying young children; and studying social behavior. This is a particularly valuable book for the research psychologist.

FREEMAN, G. L. *The Energetics of Human Behavior.* Ithaca: Cornell University Press, 1948, pp. 344. $3.50.

Dr. Freeman was formerly Professor of Psychology and Director of the Laboratory of Psychophysiology at Northwestern University. This book consists of an integrative interpretation of the psychodynamic implications of modern physiological experimentation. An introductory chapter discusses systematic behavior theory. Three chapters discuss the organismic energy system, the homeostatic response curve and the principles of homeostatic behavior. The psychophysiological determinants of motivation, learning, discrimination, and personality differentiation are each given separate chapters. A concluding chapter attempts a psychophysiological interpretation of behavior disorders and methods of therapy. Perhaps this little book might be regarded as the successor to Troland's classic volumes on psychophysiology but written from a much more practical point of view. This is required reading both for practicing clinicians and students.

BUROS, OSCAR K. (Ed.) *The Third Mental Measurements Yearbook.* New Brunswick: Rutgers University Press, 1949, pp. 1047. $12.50.

The third volume of the *Mental Measurement Yearbooks* presents an authoritative and up-to-date evaluation of all the commercially available tests available in the English-speaking countries covering the period from 1940 through 1947. This volume lists 663 tests with 713 original and 851 reprinted reviews, and also 3368 book and journal references on the construction, use and validation of specific tests. The general plan and objectives follow the organization of the second yearbook published in 1940. This is an essential reference book for all who are concerned with the modern testing movement.

McNEMAR, QUINN. *Psychological Statistics.* New York: Wiley, 1949, pp. 364. $4.50.

Dr. McNemar is a Professor of Psychology, Statistics and Education at Stanford University, and a recognized authority on statistics in psychology. This volume covers all the statistical techniques, except factor analysis, that are frequently useful in psychological research. Emphasis is placed in the understanding of mathematical fundamentals with special stress on underlying assumptions, permissible interpretations and inferences, and limitations. The presentation is scholarly and perhaps too difficult for the beginning student because of the omission of detailed examples of the application of the various measures.

HARRIS, NOEL G. *Modern Trends in Psychological Medicine — 1948.* New York: Hoeber, 1948, pp. 450. $10.00.

In England, the field of psychiatry is generally designated as psychological medicine. This is a collection of nineteen papers on various aspects of psychiatry, clinical psychology and mental hygiene written primarily by English authorities. The orientation is primarily theoretical and interpretative rather than being concerned primarily with research results. Particularly important are the chapters by Wright on the physiology of the emotions, James on diagnostic methods, Edkins on further developments in abreaction, and Hamley on Character formation in relation to education. The editor has succeeded in living up to his stated objective of producing a more "visionary" approach to the problem of integrating the contributions of medical psychology with the advance of civilization.

HAVIGHURST, ROBERT J. and HILDA TABA. *Adolescent Character and Personality.* New York: Wiley, 1949, pp. 315. $4.00.

This is a preliminary report of a study of adolescent youth in a midwestern town with a population between 5,000 and 10,000 conducted by the Committee on Human Development of the University of Chicago. This study is of interest to clinical psychologists not only in relation to the results of its psychological and sociological studies, but also because part five consists of a collection of nine brief papers on methods of studying character and personality.

FISHBEIN, MORRIS and ERNEST W. BURGESS (Eds.) *Successful Marriage.* Philadelphia: Blakiston, 1947, pp. 547. $4.50.

Thirty-eight distinguished contributors present a comprehensive discussion of all phases of marital relationships. The discussions are scientifically oriented and suitable for college courses in marriage counseling, the family, hygiene, child guidance and home economics. Although problems of sex adjustment are emphasized prominently, other aspects of marriage are given their just due.

POLATIN, PHILLIP and ELLEN C. PHILTINE. *How Psychiatry Helps.* New York: Harper, 1949, pp. 242. $3.00.

The senior author is Associate in Psychiatry at Columbia's College of Physicians and Surgeons and Associate Clinical Psychiatrist at the N. Y. State Psychiatric Institute. It is intended to clarify the nature of mental disorders and their treatment for the layman.

LORAND, SANDOR. *The Yearbook of Psychoanalysis. Vol. 3.* New York: International Universities Press, 1948, pp. 309. $7.50.

Twenty important contributions from the psychoanalytic literature are reprinted in this volume. Most of these papers were originally published in 1945 or 1946 so that the collection presents a representative cross-section of current analytic thinking.

OBERNDORF, C. P. *Which Way Out.* New York: International Universities Press, 1948, pp. 236. $3.25.

Dr. Oberndorf is Professor of Psychiatry at Columbia University and past president of the American Psychoanalytic Association. This is a collection of fictional accounts of patients and their problems, showing how analytic psychiatry uncovers the unconscious sources of problem behavior.

KLEIN, VIOLA. *The Feminine Character.* New York: International Universities Press, 1948, pp. 228. $3.75.

This is an American reprint from the English edition of 1946. Dr. Klein is a prominent British psychoanalyst known for her studies of women and children. Dr. Klein discusses the views of Havelock Ellis, Otto Weininger, Sigmund Freud, Helen B. Thompson, Terman and Miles, Mathias and Mathilde Vaerting, Margaret Mead and W. L. Thomas as they reveal differing approaches to the feminine character.

EISLER, K. R. (Ed.) *Searchlights on Delinquency.* New York: International Universities Press, 1949, pp. 456. $10.00.

This is a well selected collection of new psychoanalytic studies of delinquency dedicated to Prof. August Aichhorn on the occasion of his 70th birthday in 1948. Since all of these papers are presented for the first time, this volume has considerable significance as being representative of analytic contributions in this field.

MULLAHY, PATRICK. Oedipus: Myth and Complex. New York: Hermitage Press, 1948, pp. 538. $5.00.

This is a theoretical interpretation of psychoanalytic theory. Ten introductory sections present abbreviated discussions of the theories of Freud, Adler, Jung, Rank, Horney, Fromm and Sullivan. For the first time these psychoanalytic interpretations of the Oedipus myth are printed in the same volume with Sophocles' Oedipus trilogy.

NEILL, A. S. *The Problem Family.* New York: Hermitage Press, 1949, pp. 224. $2.75.

This is a philosophical discussion of the problem family, particularly in its role as a producer of problem children.

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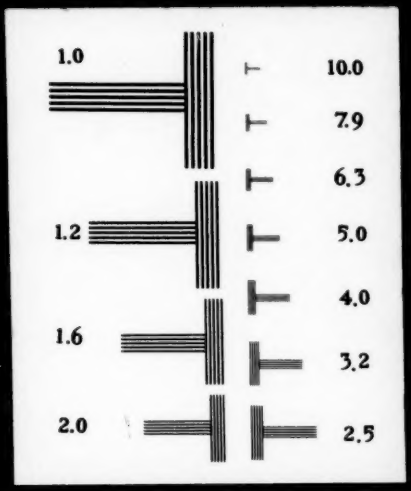

100 MILLIMETERS

INSTRUCTIONS Resolution is expressed in terms of the lines per millimeter recorded by a particular film under specified conditions. Numerals in chart indicate the number of lines per millimeter in adjacent "T-shaped" groupings.

In microfilming, it is necessary to determine the reduction ratio and multiply the number of lines in the chart by this value to find the number of lines recorded by the film. As an aid in determining the reduction ratio, the line above is 100 millimeters in length. Measuring this line in the film image and dividing the length into 100 gives the reduction ratio. Example: the line is 20 mm. long in the film image, and $100/20 = 5$.

Examine "T-shaped" line groupings in the film with microscope, and note the number adjacent to finest lines recorded sharply and distinctly. Multiply this number by the reduction factor to obtain resolving power in lines per millimeter. Example: 7.9 group of lines is clearly recorded while lines in the 10.0 group are not distinctly separated. Reduction ratio is 5, and $7.9 \times 5 = 39.5$ lines per millimeter recorded satisfactorily. $10.0 \times 5 = 50$ lines per millimeter which are not recorded satisfactorily. Under the particular conditions, maximum resolution is between 39.5 and 50 lines per millimeter.

Resolution, as measured on the film, is a test of the entire photographic system, including lens, exposure, processing, and other factors. These rarely utilize maximum resolution of the film. Vibrations during exposure, lack of critical focus, and exposures yielding very dense negatives are to be avoided.

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